mcneill management limited

**GOVERNMENT OF NEWFOUNDLAND & LABRADOR**

**Department of Environment**

OFFICE OF THE MINISTER

P. O. BOX 4750
ST. JOHN'S, NEWFOUNDLAND
A1C 5T7


ENVIRONMENTAL IMPACT STATEMENT
for the proposed
Governor's Park Recreational Complex

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Pursuant to Section 18 of the Environmental Assessment Act, I hereby declare the attached document entitled:

Second Revision Environmental Impact Statement for Governor's Park Salmonier Line, Newfoundland

produced by: McNeill Management Limited

and dated August 5, 1985 constitutes the only approved environmental impact assessment to be submitted by (proponent):

Governor's Park Incorporated

for the undertaking registered with my Department on June 20, 1985 under the title of: Governor's Park Salmonier Line

and bearing the File No. 291.49.0001 with the files maintained by my Department.

Dated: Sept. 11, 1985

Minister

SECOND REVISION

ENVIRONMENTAL IMPACT STATEMENT

FOR

GOVERNOR'S PARK

SALMONIER LINE, NEWFOUNDLAND

AUGUST 5, 1985

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INTRODUCTION

In accordance with The Environment Assessment Act, Governor's Park Proposal was registered with the Department of Environment on June 20, 1984.

Subsequently, a letter dated July 31, 1984 was forwarded to the proponent by the Minister of Environment, requesting that an Environmental Impact Statement be prepared. That letter included some of the environmental concerns expressed by various government departments.

On August 10, 1984, a meeting was held between the proponent and his representatives, together with representatives from all government departments who had expressed concern about Governor's Park Development.

On September 11, 1984, the Minister of Environment appointed a committee to advise him on the scientific and technical matters relating to the Environmental Impact Statement.

On October 12, 1984, the proponent and his representatives met with the Minister's appointed committee to discuss the preparation of the Terms of Reference for the Environmental Impact Statement (E.I.S.).

On December 18, 1984 the Terms of Reference were submitted to the Minister of Environment, who subsequently advised of his approval by letter dated December 27, 1984.

## 1. SUMMARY OF IMPACTS/MITIGATIONS

The following environmental concerns have been addressed in this Environmental Impact Statement (EIS), and their impacts may be summarized as follows:

### Soil Wash

Construction techniques will be employed during the construction phase to minimize soil wash into Hender's Brook and the Salmonier River. After construction, landscaping will be used to stabilize slopes and to act as a filtering medium and energy dissipator to reduce erosion and subsequent soil wash.

### River Buffer Zone

A strip of land approximately 160 metres wide will be left undeveloped along the north side of the Salmonier River.

Waste and Sewage Disposal

Garbage from the site will be disposed at the Mt. Carmel dump site.

Sewage will be collected at a central point, treated and pumped to a disposal field situated about 500 metres from the Salmonier River.

Chlorine residuals in swimming pool water will be neutralized prior to discharge.

Salmon Fishing

Fishing in the Salmonier River will be monitored to determine if there is any depletion of stock.

Wildlife Population

Hunting and trapping of the wildlife population on this property has been prohibited for several years.

Access to the caribou calving area in the Avalon Wilderness Area will be controlled by natural barriers. As well, there is a requirement for access permits, which may be obtained from the Wildlife Division, Department of Culture, Recreation and Youth.

Salmonier Nature Park

No specific impacts have been identified. Increased staff could handle future increases in the number of park visitors.

Storage of Chemicals

All chemicals associated with the operation of the park will be properly stored in accordance with regulations of the Department of Environment and other regulatory agencies.

Quarry Sites

Quarrying will not be carried out on site.

Landscape Treatment

Areas requiring landscape treatment have been identified. Landscaping will consist of paving, sodding, seeding, tree and shrubbery planting. The overall landscape treatment will transform a boggy and poorly forested site into a more attractive and functional area.

Dust Control

The main road through the park will be paved and other roads and parking areas will be treated with calcium chloride, if the need arises.

Management and Maintenance

Security and maintenance personnel will be employed to monitor the daily operations of the park, as well as oversee any emergencies that may arise.

## 2. THE PROPOSED ACTION

### A. Identity of the Proponent

Governor's Park Incorporated will be the owner and operator of this resort. The main shareholder of this company will be Dr. Barry Fraser, M.D. Dr. Fraser is freehold owner of 100 hectares of property on the Salmonier Line, 80 of which will be developed as Governor's Park.

Dr. Fraser is a native of St. John's, who now resides at Topsail, Conception Bay, and who together with other doctor's operate medical clinics in both Topsail and Kelligrews.

Dr. Fraser is married with two children and is keenly interested in developing this family orientated resort facility.

In 1981, Dr. Fraser subdivided approximately 20 hectares of his property into 41 building lots to sell for summer cabin development. About one half of those building lots have been sold to date.

2. THE PROPOSED ACTION (cont'd)

B. Need for the Proposed Action

(1) Justification for

(a) the demand

In 1982, Dr. Fraser approached the firm of Hart, Sheppard and Dawe, Chartered Accountants, with a concept to develop his land on the Salmonier Line, as a resort area. Hart, Sheppard and Dawe undertook a preliminary study based on available statistical data and along with cost estimates provided by McNeill Management Ltd., determined that Dr. Fraser's concept, could be economically feasible if the perceived markets existed.

Following this preliminary study the firm of William Bishop & Associates was hired to carry out a detailed market study with the following terms of reference:

(i) Investigate all perceived markets to determine the extent of each.

(ii) Determine the types of facilities required by each market.

(iii) Determine the prices that could be charged for these facilities.

B. Need for the Proposed Action (cont'd)

(iv) On the basis of the forego[illegible], advise if the project would be economically viable.

With 50% financial assistance from the Department of Regional and Industrial Expansion, this $30,000.00 market study was completed in the spring of 1984. The market study concluded that there was sufficient demand to warrant the provision of specific facilities, which will be later identified in this E.I.S. The study further concluded that if Government assistance were available to aid in the capital cost, then the project would be economically viable.

In early 1984, an application was made to the Department of Regional and Industrial Expansion (DRIE) for a grant in the amount of $2,036,000.00 based on an estimated capital cost of $5,316,000.00. In March, 1985, a grant was approved by DRIE in the amount of the lesser of 35% of eligible capital costs or $1,435,000.00.

B. Need for the Proposed Action (cont'd)

In considering the amount of the grant, DRIE did not approve the cost of campgrounds as an eligible capital cost. As a result, the project had to be re-evaluated to determine if it would still be economically viable given the ever increasing capital costs and the reduced grant.

It was determined that by reducing the number of camp sites initially, the project would still be viable. The revised capital cost of this project is now estimated to be $6,000,000.00.

NOTE

The market study conducted by Wm. Bishop & Associates was very comprehensive. It was felt that rather than extract all the statistics and tables from this study, it would be better to refer to it as a reference manual with the understanding that it is available for scrutiny to anyone who is genuinely interested.

B. Need for the Proposed Action (cont'd)

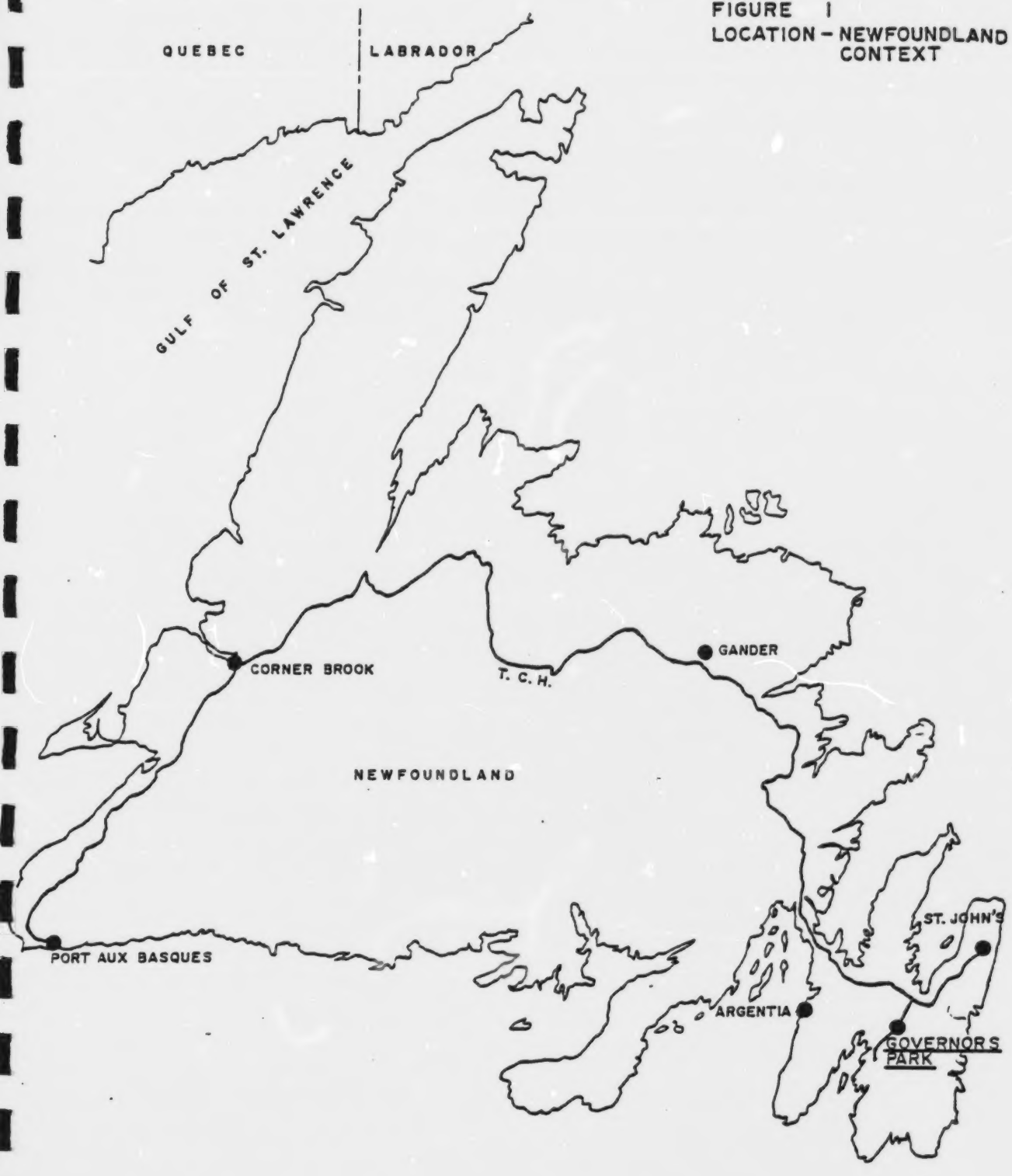
(1) Justification for

(b) The location selected

The site for Governor's park has been selected because it is owned by the major shareholder, Dr. Barry Fraser. Other features that enhance its location are its nearness to a major Salmon River and its closeness to St. John's and other major transportation points.

Figure 1 shows the relationship of Governor's Park to major airline and ferry terminal routes in Newfoundland. Figure 2 shows the location of the proposed park in relation to St. John's, the Trans Canada Highway and the Argentia Ferry Terminal.

FIGURE 1
LOCATION – NEWFOUNDLAND CONTEXT



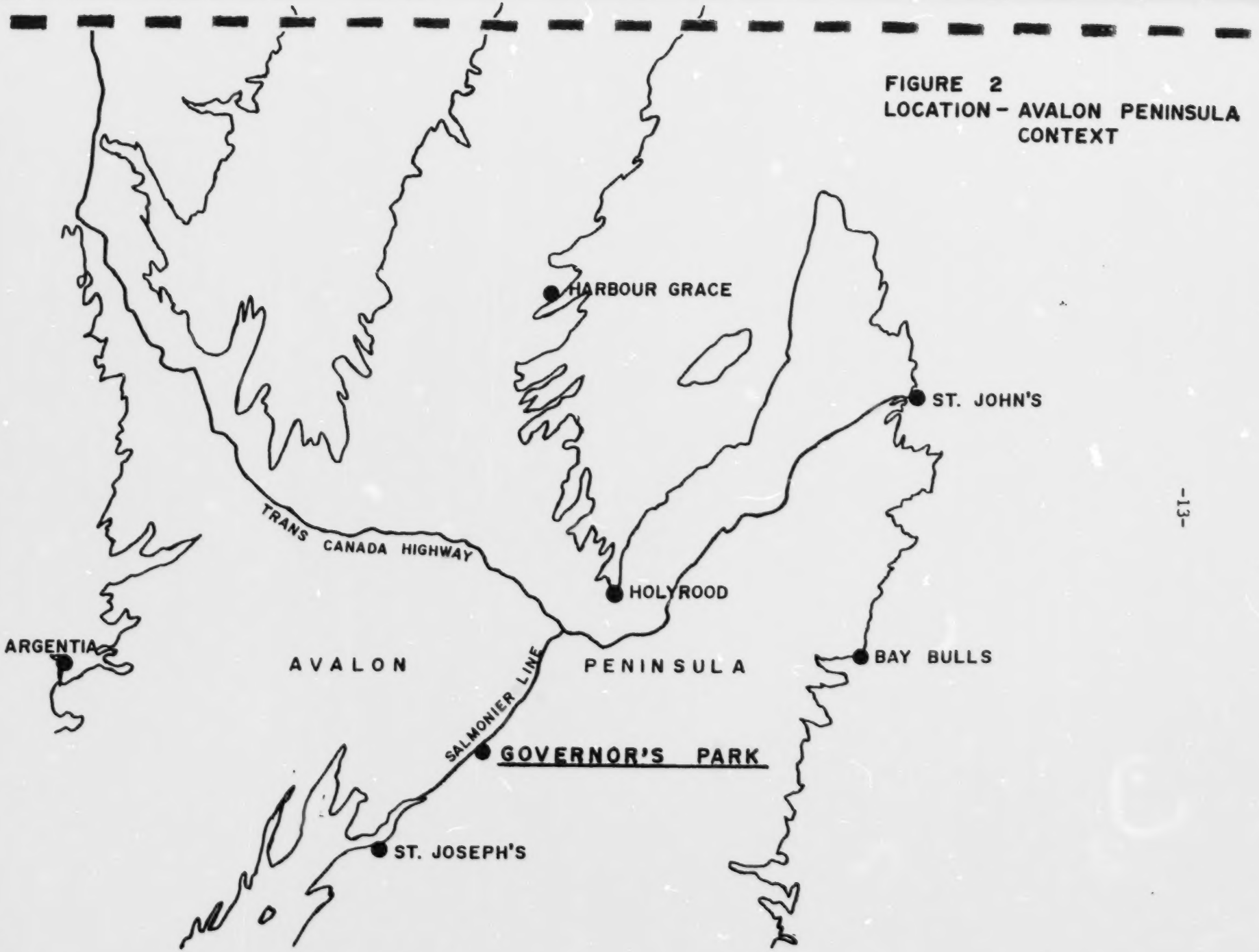



FIGURE 2
LOCATION - AVALON PENINSULA CONTEXT

B. Need for the Proposed Action (cont'd)

(1) Justification for

(c) the timing

Table 1 shows the results of a survey of local campers. These figures have been extracted from the survey conducted by Wm. Bishop & Associates. It is obvious from these results that a local market exists for the campground and attraction facilities that are proposed.

In addition, according to the statistics of the Provincial Parks, 166,000 people from out of the Province visited these parks in 1983. Since the market study indicated that facilities provided in Provincial parks are substantially below the standard expected by out of the Province visitors, it is assumed that if proper facilities were available, then a fair number of these visitors could be attracted. A conservative estimate indicates that a market of 8,000 people, all from out of the Province, could be attracted to Governor's Park.

TABLE 1

LOCAL MARKET SURVEY OF CAMPGROUND AND ATTRACTION REQUIREMENTS

| DESCRIPTION OF FACILITY | ESTIMATED MARKET | %I | %S | %N |
|---|---|---|---|---|
| CAMPGROUNDS | | | | |
| Fully Serviced Campsites | 42,043 | 48 | 20 | 30 |
| Unserviced Campsites with following services | | | | |
| -flush toilets | 70,311 | 81 | 12 | 7 |
| -showers | 54,370 | 63 | 26 | 11 |
| -laundry facilities | 33,349 | 39 | 31 | 30 |
| -barbecue area | 50,014 | 58 | 22 | 20 |
| -campfire area | 66,688 | 77 | 19 | 3 |
| -playgrounds | 50,739 | 59 | 17 | 24 |
| -open air pavillion | 32,624 | 37 | 43 | 19 |
| -picnic tables | 68,138 | 79 | 19 | 2 |
| -adult only area | 31,166 | 36 | 24 | 40 |
| ATTRACTIONS | | | | |
| Convenience Store | 50,739 | 59 | 23 | 18 |
| Restaurant/snack bar | 21,022 | 24 | 32 | 44 |
| Indoor swimming pool | 65,789 | 44 | 18 | 37 |
| Outdoor swimming pool | 67,766 | 46 | 26 | 27 |
| Indoor tennis courts | 35,518 | 24 | 17 | 58 |
| Outdoor tennis courts | 49,345 | 33 | 22 | 44 |
| Tennis lessons | 23,684 | 16 | 14 | 60 |
| Mini golf | 71,706 | 48 | 19 | 32 |
| Waterslides | 72,360 | 49 | 24 | 27 |
| Squash courts, exercise rooms, suana | 46,391 | 54 | 24 | 21 |

I- Important or likely to use

S- Somewhat important or somewhat likely to use

N- Not important or rarely or never use

Source - Market Study by Wm. Bishop and Associates

B. Need for Proposed Action (cont'd)

A market for fixed roof facilities was identified by a survey of bus tour operators. This survey identified a market of 300 bus tours, each of which would have an average of 41.5 persons (mostly senior citizens) who would stay an average of 1 1/4 days. The results of a detailed study, undertaken by the proponents, concluded that 60 fixed roof units would be required to accommodate the predominantly interprovincial and international visitors.

These surveys conclude that market conditions are such that this development may proceed immediately. It is therefore intended to commence construction as soon as approval of this EIS is received. The following is a tentative construction schedule:

| | |
|---|---|
| Approval of EIS | August 1, 1985 |
| Widen and Upgrade Main Access Road | August 5, 1985 - September 13, 1985 |
| Construction of Lodge | August 19, 1985 - May 16, 1986 |
| Construction of Chalets, Convenience Store, Other Miscellaneous Small Buildings | August 19, 1985 - May 16, 1985 |
| Water and Sewer Construction | August 19, 1985 - December 13, 1985 |
| Dam and Intake | September 4, 1985 - October 12, 1985 |
| Trailer Park | September 9, 1985 - May 16, 1986 |
| Waterslides and Outdoor Pool | September 9, 1985 - June 21, 1986 |
| Mini Golf and Playground Area | September 9, 1985 - June 21, 1986 |
| Picnic Sites, Walking Trails | September 9, 1985 - May 16, 1986 |

It is tentatively scheduled that the park will commence operation on the Victoria Day Weekend, 1986.

B. Need for the Proposed Action (cont'd)

(ii) Relationship of current policies, controls and plans

Meetings have been held with the following Government Departments and interest groups to ensure that they were afforded the opportunity to express their concerns and to address any such concerns in this Environmental Impact Statement.

Government of Canada

Fisheries and Oceans

Environment Canada

- Environmental Protection Service

Ministry of State for Forestry

- Canada Forestry Service

Government - Province of Newfoundland and Labrador

Department of Culture, Recreation and Youth

- Wildlife Division

Department of Development

Department of Environment

Department of Fisheries

Department of Health

Department of Justice

- Fire Commissioner's Office

B. Need for the Proposed Action (cont'd)

Department of Mines and Energy

Department of Municipal Affairs

Department of Public Works and Services

Department of Transportation

Interest and Advisory Groups

Newfoundland & Labrador Wildlife Federation

Wilderness and Ecological Reserves Advisory Council

St. John's Rod and Gun Club

Salmon Association of Eastern Newfoundland

Newfoundland Natural History Society

## 2. THE PROPOSED ACTION

### C. Description of the Proposed Action

#### (1) General Layout

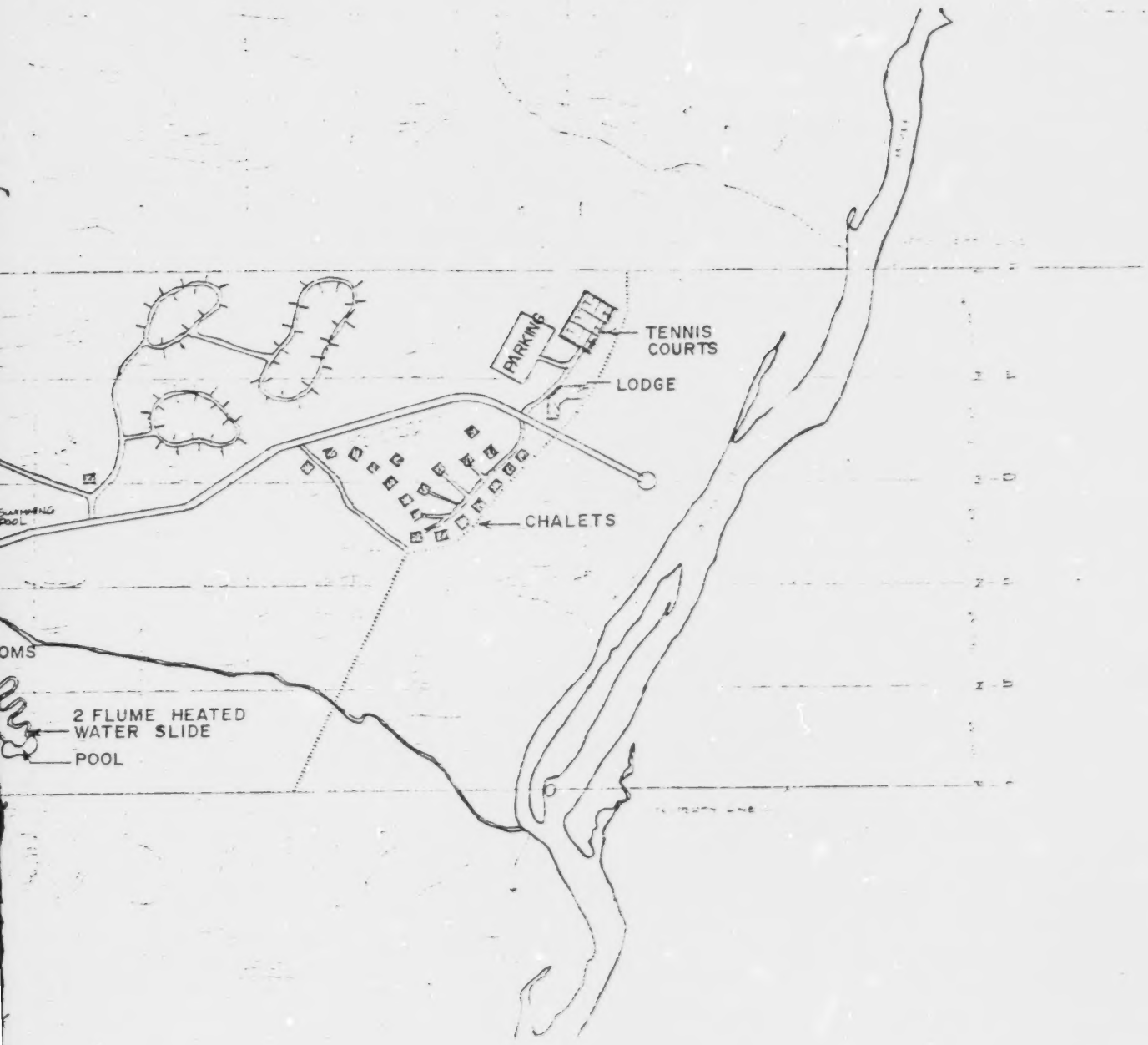
Figure 2 shows the location of Governor's Park in relation to St. John's, the Trans Canada Highway, and the Argentia Ferry Terminal.

Figure 3 is a general layout of Governor's Park showing the following areas

- trailer park
- attractions
- chalet
- walking trails and picnic sites
- lodge

CAMP SITES
SALMONIER LINE
PROPOSED
ACCESS ROAD
PARKING
PRO-SHOP
WASHROOMS
MINI-GOLF

FIGURE 3
GENERAL LAYOUT



C. Description of the Proposed Action (cont'd)

(II) Design details

Specific details on the components of Governor's Park are as follows:

(a) Trailer Park

The final development will contain 250 sites. About 10% of these will be sized for camps only while the remaining sites will be large enough to accommodate trailers.

As previously stated, the grant from DRIE does not provide any contribution for the development of the trailer park, consequently, the available funding will only permit initial development of a portion of these sites. It is intended to initially develop 90 trailer sites, and 10 sites suitable for camping. A central washroom including wash basins, toilets and shower facilities with be provided. Each of these sites will be provided with barbecue and/or camp fire facilities. As funding permits, the remaining area of the trailer park will be developed.

C. Description of the Proposed Action (cont'd)

The trailer park will be called "Beothuck Village" with an entrance designed from natural surroundings. Resting atop the gate will be a Beothuck canoe. Attendants will be dressed in Beothuck attire, structures will be in Beothuck mamateek forms. Various signposts will tell of the Beothuck way of life and guides will be able to answer questions and hold demonstrations pertaining to Beothuck history.

C. Description of the Proposed Action (cont'd)

(b) Attractions

(i) Kid's Playground

Two playground areas will be provided for smaller children. The location of these areas are shown in Figure 3. These playground areas will consist of rope climbs, log jumps, etc., along with the traditional see-saws, swing sets and chutes.

C. Description of the Proposed Action (cont'd)

(ii) Waterslides and outdoor pool

Two water slides will be constructed in the area as shown in Figure 3 with the configuration shown in Figure 4. The splash down pool for the water slides will be enlarged to double as an outdoor swimming pool.

The water supply for the slides and the swimming pool and the disposal of waste water will be dealt with later in this EIS under a discussion of water supply and sewage disposal for the entire park.

Water to the slides will be continuously filtered and recirculated by use of 25 horsepower pumps. Provision will be made to heat this water supply on days when the water temperature is uncomfortable. The components for the water slides and the pool will be purchased from a reputable supplier with a good safety record, and erected to his specifications.

It is anticipated these facilities will be the most extensively used in the Park and will be attractive to both young and old. Washrooms and change rooms will be located in the nearby convenience store.

FIGURE 4
WATERSLIDE AND
CONVENIENCE STORE AREA

C. Description of the Proposed Action (cont'd)

(iii) Mini Golf Course

This will probably be the first such facility in this Province. It will be an 18 hole mini golf course which has gained tremendous popularity on the mainland of Canada and throughout the United States. It will also be one of the feature attractions of the Park. Rental of clubs and golf balls will be available from the nearby convenience store.

C. Description of the Proposed Action (cont'd)

(iv) Convenience Store and Snack Bar

This building will be located immediately adjacent to the water slides and mini golf course. In addition to a convenience store and snack bar, it will also house male and female washrooms, change rooms, a laundromat, a storage room and a first aid room.

This facility is shown in Figure 4.

C. Description of the Proposed Action (cont'd)

(c) Chalets

Twenty chalets of approximately 55 square metres each will be constructed. The chalet area will be called "Outharbour" and will feature an appropriate entrance with a Newfoundland dory. Features will consist of pucheons, flakes and other outport paraphernalia. Attendants will be dressed in typical outport style and will be able to voice off the best of Newfoundland sayings. Singposts will display various facets of outport life. The chalets themselves will be built in typical Newfouldand saltbox fashion and will be located as shown on Figure 3.

C. Description of the Proposed Action (cont'd)

(d) Picnic Sites and Walking Trails

Winding throughout the 80 hectare sites will be several kilometres of walking trails. These trails will pass by areas of interest, such as Hender's Stream, which crosses the property and drops dramatically through a granite gorge before entering the Salmonier River. Spaced selectively along these walking trails will be cleared picnic sites providing the ultimate in privacy in an outdoor setting.

These walking or hiking trails will double as cross country ski trails during the winter months.

C. Description of the Proposed Action (cont'd)

(e) Lodge

Some of the features of the lodge will be

- 36 double rooms
- 4 extra large rooms or suites
- 100 seat dining room
- 150 seat lounge
- sauna room
- exercise room
- 80 person meeting room
- 3 indoor squash courts
- an indoor swimming pool
- 3 outdoor lighted tennis courts.

These facilities, with the exception of the tennis courts, are intended to be operated on a year round basis. The lodge will be called Governor's Mansion and will be designed to give the impression of a 19th century St. John's colonial mansion. Boarding house hospitality will be the rule. Attendants will reflect various segments of early St. John's life, all the way from the Governor to the kitchen staff.

C. Description of the Proposed Action (cont'd)

The dining room will feature a menu with selections to correspond with the various areas of the park such as:

From Beothuck Village
- caribou and moose steaks and soups
- fresh native trout
- other wild game, etc.

From Outharbour
- Nfld. homemade vegatable and pea soup
- salt fish and drawn butter
- fish and brews
- lobster from the pound

From the Governor's Pantry
- toutons
- Nfld. smoked salmon
- Governor's sized portions of traditional food

C. Description of the Proposed Action (cont'd)

The Governor's wine cellar will feature Newman's port and a large selection of other top quality wines. The lounge will feature evenings of traditional music, capelin and saltfish pub snacks. Good old Newfie Screech will be furnished in typical outport charm.

Governor's Park will offer a complete Newfoundland flavoured vacation starting with pickup from the St. John's Airport or greetings at the ferry in Argentia on to the final Newfoundland send off. Each day guests will have the opportunity to do any of a large assortment of activities, all organized by park staff to assure the complete relaxation of guests. Offered will be such items as

(a) Trips to the Salmonier Nature Park, scenic outport tour, St. John's tours.

(b) Boating on Conception Bay to go tuna fishing, cod jigging, whale watching, etc...

(c) Schooner rides, if available.

(d) Rides on the Newfie Bullet, if available.

(e) Trouting expeditions to inland ponds. Should these occur within the Avalon Wilderness area, the necessary permits will be obtained.

(f) Fly-in trips to remote Newfoundland areas for some of the best trout fishing in the world.

(g) Golf (if it can be arranged with a local club).

C. Description of the Proposed Action (cont'd)

There will always be on site activities organized, such as, tennis and squash tournaments, various festivals, craft exhibitions, lobster boils, etc., etc., etc...

Staff will be trained rigorously to assure each guest is completely looked after in fine old Newfoundland tradition.

Figure 3 shows a general location view of the lodge, while Figure 5 depicts an artists rendering.

FIGURE 5
ARTIST'S RENDERING
OF LODGE

GOVERNOR'S PARK

MCNEILL MANAGEMENT LTD.
PROJECT MANAGERS

WILLIAM MACCALLUM, ARCHITECT LTD.

PHILIP HICKS AND ASSOC.
LANDSCAPE ARCHITECT

C. Description of the Proposed Action (cont'd)

(f) Other Design Aspects

(i) Highway signs and advertising

"Governor's Park" will be added to the existing Department of Transportation service signs located on the Trans Canada Highway approximately one kilometre either side of the Salmonier Line junction. Another sign will be erected at the Main Entrance to Governors Park and will follow a format as outlined in Figure 6.

(ii) Site Servicing

Water and sewage systems, roads drainage systems, etc. will be discussed in Section 3 and 4 of this E.I.S.

FIGURE 6
ARTIST'S RENDERING
OF ENTRANCE

2. THE PROPOSED ACTION (cont'd)

D. Alternatives

The only feasible alternative to the proposed development is to turn the entire area into a summer cabin development, such as already exists at the top part of the development near the Salmonier Line.

The existing cabin development contains 41 building lots in a 20 hectare site. It is conceivable that if the entire site were developed for summer cabins, the additional 80 hectares could contain 164 building sites for a total development of 205 building sites. This would provide a short term gain for the proponent but in the overall scheme of things would result in the obscurity of a beautiful setting. Under the Governor's Park proposal, this setting will be enhanced for the enjoyment of the general public.

## 3. THE PRESENT AND FUTURE ENVIRONMENT

### A. Topography and Drainage

The site of the development is topographically rugged with a steep slope of approximately 6 per cent between the Salmonier Line and the Salmonier River. (See Figure 3). The upper part of the site is generally flatter and more undulating than the lower portion. Although grades of 4-5 per cent persist, there are lower lying, flatter areas where bog occurs. The lower part of the site grades severely to the river for the last 200 metres. Slopes through this lower portion can be as high as 15 per cent.

Of topographically interest is Hender's Brook which flows through the site in a generally southerly direction. Along the upper part of the site, this brook flows fairly quickly along its meandering route. The banks of the brook are only occassionally steeply sloping and, in general, are not particluarly wide. Along the lower portion of the site, however, the brook gorges through a very steep sloping ravine with severely sloping banks. This section of the site is generally not developable for major infrastructure components.

A. Topography and Drainage (cont'd)

As can be seen in Figure 3, park facilities have been proposed and located in areas to best take advantage of the natural terrain and topography. For example, the Lodge is sited at the top of a ridge overlooking the Salmonier River Valley; the water flumes have been located to best take advantage of the slopes in that area; the main access road will closely follow the grade and alignment of the existing road; roads to the trailer sites will be graded and aligned to best take advantage of existing contours and topographical features. In general, the earth moving component of the overall site development will be kept to a minimum and drainage patterns will remain essentially unchanged.

3. THE PRESENT AND FUTURE ENVIRONMENT (cont'd)

B. Soils Information

Three distinct areas where common soil types occur have been identified and are shown in Figure 7.

Area I

Soils underlying the bog habitat are organic, comprised of sedge and Sphagnum remains, to a depth of 0.5 to 3.0 m. The peat is generally saturated with water near the surface for most of the year. Moisture content of the peat varies from 90-97% and organic matter ranges from 80 to 90%. The Sphagnum-sedge peat is nutrient poor in comparison to surrounding mineral soils, being low in total and available nitrogen, phosphorus, potassium and calcium. The pH range is 3.48-4.06. The soils are dominantly Typic Mesisols, since the

VEGETATION LEGEND

| | |
|---|---|
| I | — Deer Grass - Sphagnum Bog Complex |
| II | — Balsam Fir - Sedge Forests |
| III | — Pleurozium Balsam Fir Forests |

SOILS LEGEND

| | |
|---|---|
| I | - Spagnum - Sedge Peat |
| II | - Typic Humisols |
| III | - Humo-ferric Podzols |

FIGURE 7

WILLIAM McCALLUM ... CO. LTD.
P.O. Box 1870
Prince Rupert, B.C.
TITLE
GOVERNMENT DOCK
DATE 1984 12 06 DRAWN BY LM
SCALE 1:6500
PROPOSED SITE SURVEY GRID

B. Soils Information (cont'd)

fibric layer rarely attains a depth greater than 60 cm. The peat in the middle tier (60-120 cm) is mesic with humification H4-5 (von Post, 1926). Terric and Lithic Fibrosols occur on bog margins where there is contact with moraine or bedrock within a depth of 10-160 cm.

Area II

The soils underlying the forest fen are Typic Humisols, except toward the margin of the deposits where there is terric contact in the middle and bottom tiers. The surface tier is comprised of fibric organic material derived from Sphagnic and/or hypnic mosses to a depth of 10 cm. The middle and bottom tiers are predominantly woody peat with a slight admixture of sedge. Maximum depth varies from 1.0 to 2.5 m.

Area III

Soils underlying the Pleurozium Balsam Fir Forests are predominantly humo-ferric podzols. Soil texture in the B and C horizons varies from loam to sandy loam, having 15-20% organic matter in the B horizon. The C horizon has 5-10% organic matter. Moisture in the B horizon is in the range of 4-6%.

B. Soils Information (cont'd)

The profile is well-drained to moderately well-drained with root penetration 30-40 cm below the organic horizons. Depth of the organic horizon varies form 10-14 cm. The water table in most cases is greater than 1 m. The pH of the organic horizon varies from 3.65 to 3.85, the B horizon is in the range 4.45 to 4.85.

The subsurface soils underlying the above generally comprise a well graded silty sand and gravel till. Typically, the till contains about 45 per cent rounded to subangular gravel, 40 per cent sand and about 5 per cent silt.

In the top 300 to 500 mm the till is highly weathered, more sandy, is reddish-brown in color and contains organics. Below this, the till is grey in color and is densely compacted. It contains cobbles, small boulders and rock fragments at depth. Rock was only encountered in 10 percent of the test pits and boreholes with depths to refusal ranging from 1.5 m to 2.5 m. There are no rock out croppings on the site. Although the soil is well graded, the high content of fines greatly reduces its permeability.

A detailed analysis of subsurface soils together with bore hole and test pit logs is listed as reference material.

3. THE PRESENT AND FUTURE ENVIRONMENT (cont'd)

C. Climatic Information

Table 2 gives a summarization of various meteorological data pertinent to the Salmonier Line area. This data includes:

| | |
|---|---|
| - Total Precipitation | 1951-1980 |
| - Mean Rainfall | 1951-1980 |
| - Mean Snowfall | 1951-1980 |
| - Mean Daily Temperature | 1951-1980 |
| - Mean Daily Maximum Temperature | 1951-1980 |
| - Mean Daily Minimum Temperature | 1951-1980 |
| - Total Bright Sunshine Hours | |

This data is presented for information purposes only. No attempt has been made to analyze data in relation to the park development.

TABLE 2

CLIMATIC INFORMATION

1951 - 1980

SALMONIER AREA

| | Jan. | Feb. | Mar. | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Year |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Precipitation | 136.8 | 139.7 | 114.4 | 95.2 | 102.5 | 98.6 | 96.9 | 124.3 | 125.2 | 140.0 | 120.4 | 154.2 | 1424.0 |
| Mean Rainfall | 109.0 | 79.3 | 79.0 | 77.1 | 99.5 | 90.9 | 86.9 | 124.3 | 125.2 | 141.0 | 125.3 | 95.3 | 1232.8 |
| Mean Snowfall | 38.4 | 38.2 | 28.3 | 9.9 | 3.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.4 | 32.7 | 155.0 |
| Mean Daily Temp. | -4.1 | -4.1 | -1.9 | 1.7 | 6.0 | 10.8 | 15.4 | 15.4 | 12.1 | 7.5 | 3.9 | -1.1 | 5.1 |
| Mean Daily Max. Temp. | -0.1 | 0.1 | 1.8 | 5.5 | 10.3 | 15.8 | 20.1 | 19.7 | 16.2 | 11.2 | 7.1 | 2.6 | 9.2 |
| Mean Daily Min. Temp. | -8.2 | -8.2 | -5.5 | -2.1 | 1.7 | 5.8 | 10.4 | 10.9 | 7.9 | 3.8 | 0.4 | -4.7 | 1.0 |
| Sunshine Hours | | | | | | 151.7 | 171.4 | 161.7 | 138.7 | | | | |

3. THE PRESENT AND FUTURE ENVIRONMENT (cont'd)

D. Water Supply and Distribution

Three sources of water have been considered for Governor's Park Development, namely, deep wells located on site, the Salmonier River and Hender's Brook which runs through the site.

In December, 1984, Nolan, Davis and Associates Limited carried out a preliminary investigation into groundwater potential on the site, wherein they recommended that deep wells could be drilled on the site and yields of approximately 10 litres per minute could be expected. Since the anticipated domestic demand for Governor's Park is 135 litres per minute, anywhere from 10-15 wells would have to be constructed to meet this demand. Additional sources would also have to be developed to meet the expected fire flows required. For these reasons, the use of wells was considered no further.

The Salmonier River has received strong consideration as a potential source of supply. The quantity of water easily meets the requirements of the site and the overall environmental impact would be minimial depending upon the techniques employed for construction of the intake. Several types of intakes and intake structures were initially considered and it was determined that an infiltration gallery

D. Water Supply and Distribution (cont'd)

constructed under the stream bed would be the least environmentally damaging both during and after construction. On the negative side, pumping costs would be very high as the Salmonier River is approximately 100 metres below areas of the site where water is required. In addition, providing fire flows would necessitate either the construction of a fairly large storage reservoir or the use of diesel pumps and standby generators with their inherent environmental problems.

Hender's Brook has its headwaters located above the Salmonier Line and in fact receives water from Gull Pond and as far away as Hawcos Pond. (See Figure 8). The overall drainage area may be as much as 2000 hectares thus providing a suitable drainage area from which to draw its water. Coupled with this, however, is the fact that there are many points at which water may be stored within the drainage area. Consequently, during periods of little or no precipitation, drainage into Hender's Brook may be substantially reduced.

Although it is difficult to precisely state the expected minimum flow in Hender's Brook, from discussions with local residents of the area, as well as existing meteorological data, we have determined that a minimum flow for the brook would be in the order of 5000 litres per minute, an

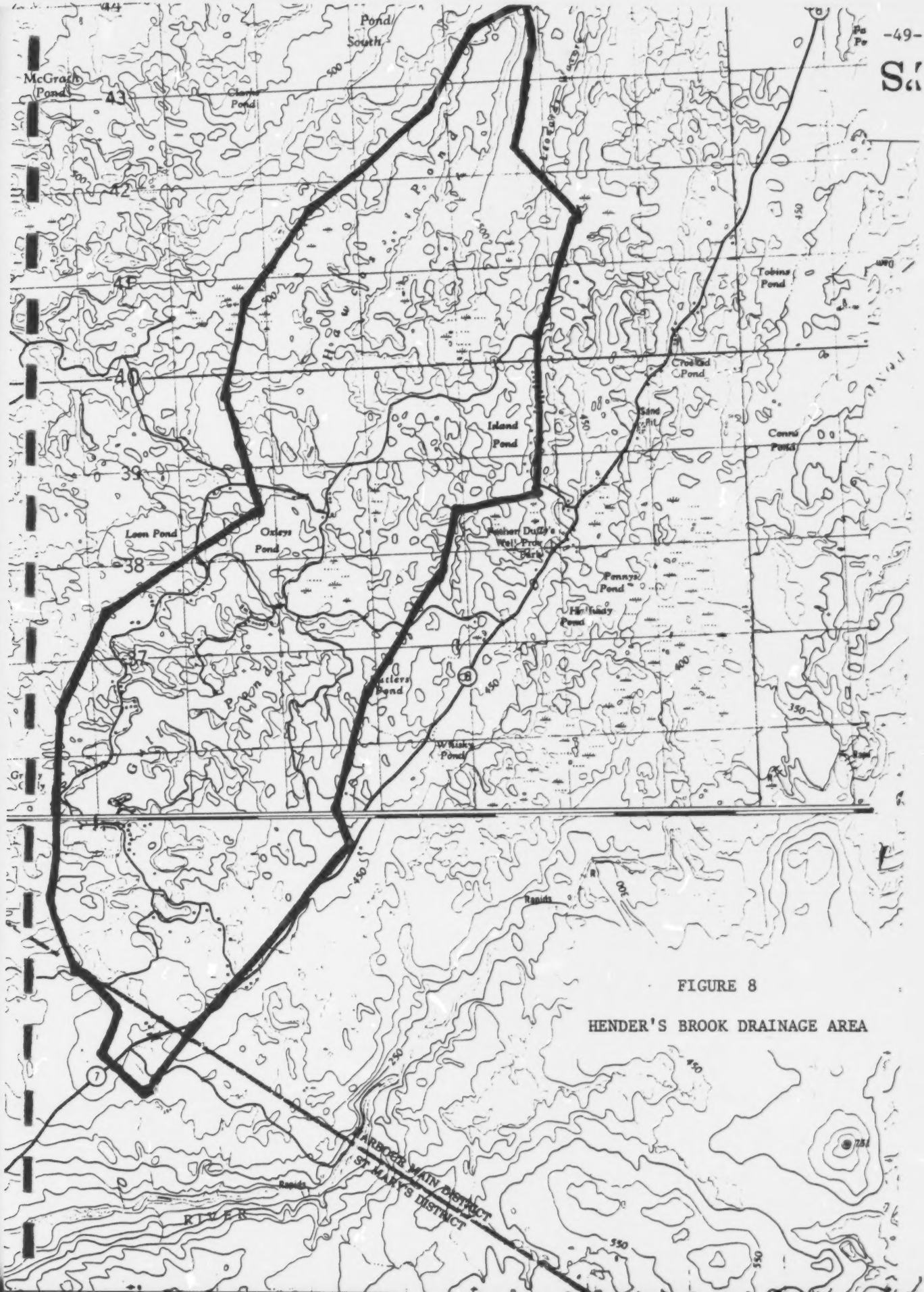



FIGURE 8

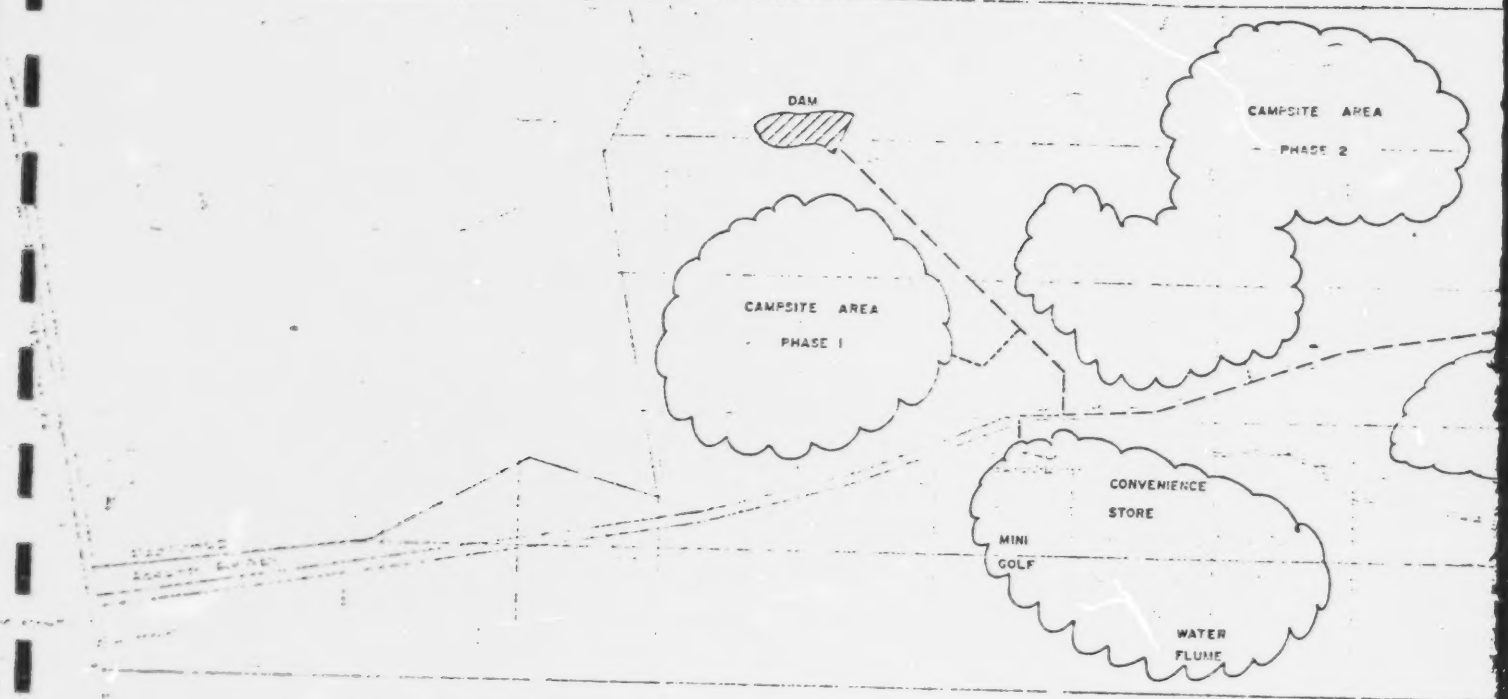
HENDER'S BROOK DRAINAGE AREA

D. Water Supply and Distribution (cont'd)

average flow of 75,000 litres per minute and a maximum flow in the order of 275,000 litres per minute. Since the expected demand for Governor's Park would be in the range of 135 litres per minute, this demand would not have a significant impact on the quantity of flow in this brook. Hender's Brook, therefore, has received the most favourable consideration as a potential source.

The water system as envisaged is shown in Figure 9. It consists of a dam and intake structure located at approximately the 80 metre contour line on Hender's Brook. A 150 mm PVC transmission line would feed directly to the lodge and chalet area while smaller distribution lines would provide water in other areas of the site. Hydrants would be placed in appropriate areas of the site thus providing a measure of fire fighting capability.

Chemical quality of the water supply is reasonably good. The results of a chemical analysis are attached as table 3. Although the precise type of chlorination system to be used has not been determined, it is proposed to provide a duplication of all the major components and a constant monitoring of residuals. Various methods of achieving contact times are also being considered.




LEGEND

---------- 75ø P.V.C WATER MAIN

———— 150ø P.V.C WATER MAIN

NOTES

1. RESIDUAL PRESSURE AT LODGE = 30 METRES (300 kPa)
2. PRESSURE TO OTHER AREAS MAY HAVE TO BE BOOSTED
3. DAM TO PROVIDE FOR MINIMUM 500m³ STORAGE
4. APPROXIMATE AVE. FLOW REQ'D. = 0.15m³/MIN. (30 G.P.M.)
5. MINIMUM FLOW IN STREAM 3m³/MIN (1000 G.P.M.)

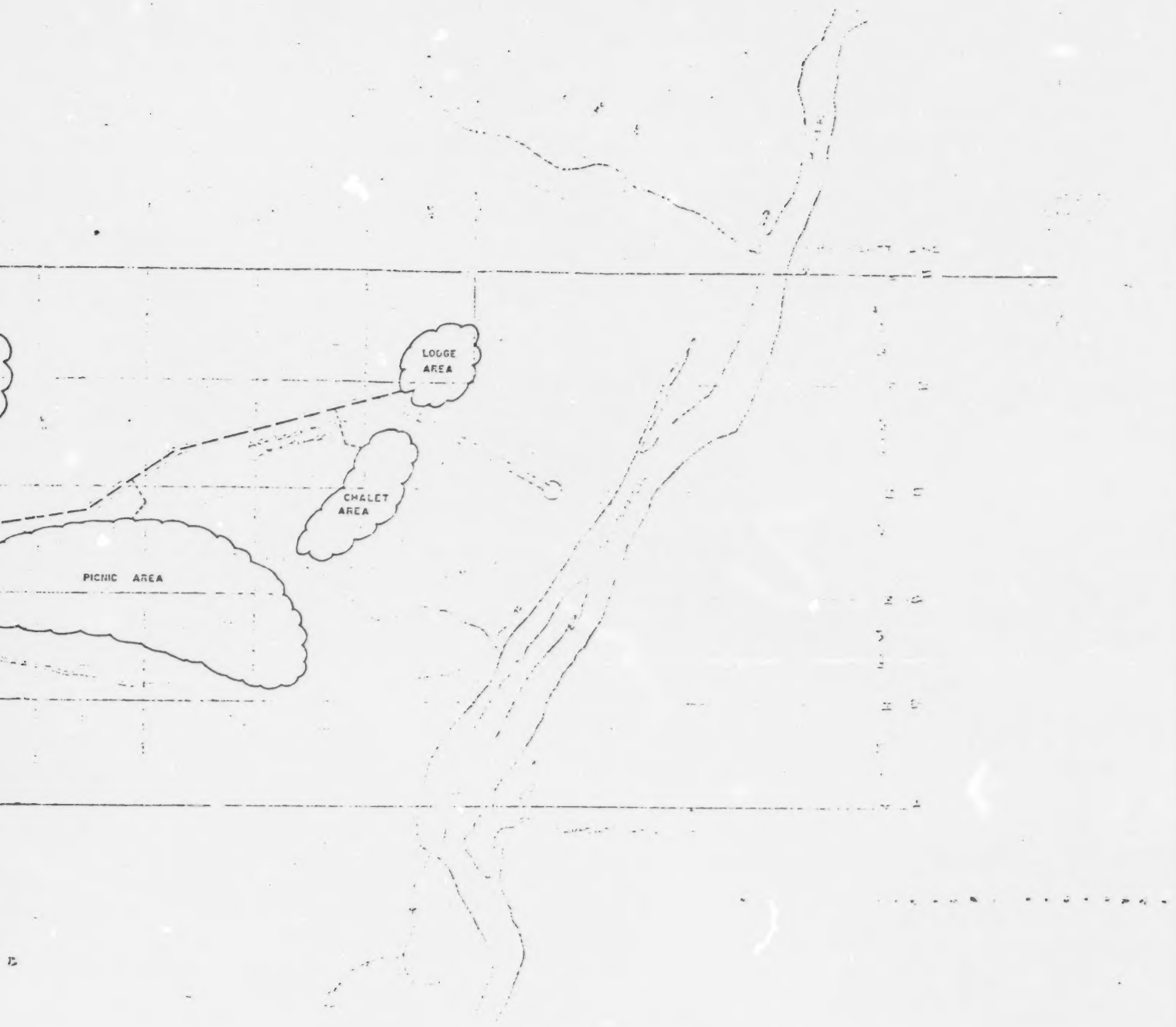



FIGURE 9

CONSULTING ENGINEERS

fga Follett Gosse & Associates Limited Consulting Engineers

PROJECT
PROPOSED WATER SUPPLY
GOVERNORS PARK

DWG. TITLE
SITE AREA LAYOUT

| DWN BY | DATE | DWG NO |
|---|---|---|
| J. Nicholson | 89 - 06 - 03 | PR - 1 |

TABLE 3

WATER ANALYSIS FACILITY
CHEMISTRY DEPT., ROOM C5016
MEMORIAL UNIVERSITY OF NFLD.
ST. JOHN'S, NF
A1B 3X7

ANALYTICAL RESULTS HENDERS BROOK

| TEST NAME | PRICE | RESULT | |
|---|---|---|---|
| Alkalinity | $ 6.50 | 2.6 | mg/L CaCO3 |
| Acidity | 0.00 | -- | mg/L CaCO3 |
| Color | 3.00 | 20 | TCU |
| Hardness | 2.50 | 6.7 | mg/L CaCO3 |
| Kjeldahl nitrogen | 8.00 | 0.38 | mg/L N |
| Nitrate (+ nitrite) | 4.50 | 0.029 | mg/L N |
| pH | 3.00 | 6.05 | units |
| Phosphorus, total | 9.00 | 0.030 | mg/L P04 |
| Conductance, specific | 3.00 | 45 | uSi/cm |
| Turbidity | 3.50 | 0.48 | NTU |
| Chemical oxygen demand | 8.50 | 20 | mg/L COD |
| Calcium | 6.50 | 1.45 | mg/L Ca |
| Magnesium | 6.50 | 0.75 | mg/L Mg |
| Manganese | 4.50 | 0.02 | mg/L Mn |
| Iron | 4.50 | 0.07 | mg/L Fe |
| Copper | 4.50 | <0.01 | mg/L Cu |
| Zinc | 4.50 | <0.01 | mg/L Zn |
| Cadmium | 10.50 | <0.0002 | mg/L Cd |

3. The Present and Future Environment (cont't)

E. Waste and Sewage Disposal

This subject will be dealt with under Section 4 (c)

3. THE PRESENT AND FUTURE ENVIRONMENT (cont'd)

F. Vegetation

There are three (3) types of vegetation, described as follows and shown in figure 7. The systems used to describe the abundance and sociability of the plant species is explained in Appendix A.

Vegetation Type I - Deer Grass - Sphagnum Bog Complex

Bogs are wet, extremely nutrient-poor organic sites with a vegetation in which Sphagnum species play a very important role and the remains of which make up the major part of the organic horizon. Bog formation within Governor's Park study areas is usually topographically controlled with most deposits situated in poorly-drained depressions between moraines.

The surficial morphology of most bogs is characterized by the following units: (1) Hummocks, (2) Hollows and Flats, (3) Slopes, (4) Pools and Ponds (Meades and Bouzane, 1975, unpublished report).

The spatial distribution of plant communities comprising the Deergrass-Sphagnum Bog Complex is dominantly controlled by the hydrology and nutrient characteristics of each of these morphological units. The ground layer is dominated by

F. Vegetation (cont'd)

Sphagnum mosses, lichen patches and trailing shrubs.

Hummocks
Floristic Composition

Dwarf Tree Layer (50-100 cm)

Picea mariana 1.2 (Black Spruce)

Larix laricina 1.2 (Juniper) (Juniper)

Epiphytes

Platismatic tuckermanii

Alectoria nigricans

Hypogrynia physodes

Usnea logissima

Dwarf Shrub Layer (30-50 cm)

Kalmia angustifolia 3.1 (Sheep laurel)

Viburnum cassinoides 1.1 (Witherod)

Vaccinium angustifolium 1.1 (Low bush blueberry)

Juniperus communis 1.2 (Ground Juniper)

Ledum groenlandicum 2.1 (Labrador Tea)

Pyrus floribunda 1.1

Amelanchier bartramiana 1.1 (Prickly pear)

Gaylussaccia dumosa 1.1

Sedge Layer (15-30 cm)

Scirpus cespitosus 2.2 (Deer grass)

Eriophorum angustifolium 1.2 (Cotton grass)

Carex pauciflora 1.2

Solidago uliginosa 1.1 (Bog goldenrod)

Eriophorum spissum 1.2

Carex exilis 2.2

Sarracenia purpurea 1.1 (Pitcher plant)

F. Vegetation (cont'd)

Herb Layer (10-15 cm)

Rubus chamaemorus 2.1
(Bake apple)

Drosera rotundifolia 1.1
(Sundew)

Coptis groenlandica +
(Golden thread)

Trientialis borealis +
(Star flower)

Cornus canadensis 1.1
(Bunch berry)

Ground Layer (0-10 cm)

Sphagnum fuscum 4.4

Sphagnum scoparium 1.2

Polytrichum juniperinum 1.1
(Feather moss)

Dicranum scoparium 1.2

Pleurozium schreberi +
(Feather moss)

Cladonia rangiferina 2.2
(Reindeer moss)

Cladonia arbuscula 2.2
(Reindeer moss)

Cladonia mitis 1.2
(Reindeer moss)

Cladonia coccifera +
(Reindeer moss)

Cladonia alpestris 1.2
(Reindeer moss)

Cladonia cristatella +
(Reindeer moss)

Cladonia uncialis +

Vaccinium oxycoccus 1.2
(Marshberry)

Cladonia boryi 1.2

Rhacomitrium lanuginosum 2.2

Sphagnum imbricatum 1.2

Hollows and Flats
Floristic Composition
Sedge Layer (20-40 cm)

Scirpus cespitosus 3.2
(Deer grass)

Carex exilis
(Sedge)

F. Vegetation (cont'd)

Calamagrostis inexpansa 1.1

Sarracenia purpurea 1.1

Chamaedaphne calyculata 1.1
(Leather leaf)

Myrica gale +
(Bog myrtle)

Kalmia angustifolia 1.1

Kalmia polifolia 1.1
(Bog laurel)

Andromeda glaucophylla 1.1
(Bog rosemary)

Ledum groenlandicum +
(Labrador tea)

Larix laricina + .1

Herb Layer (10-20 cm)

Drosera intermedia 2.1
(Sundew)

Arethusa bulbosa 1.1

Rubus chamaemorus 1.1

Smilacina trifolia 1.1

Empetrum nigrum +
(Black crowberry)

Ground Layer (0-10 cm)

Vaccinium oxycoccus 1.2

Vaccinium macrocarpon 3.2

Sphagnum flavicomans 3.3

Sphagnum tenellum 4.4

Sphagnum fuscum 2.2

Cladonia arbuscula 1.2

Cladonia uncialis 1.2

Cetraria islandica 1.2

F. Vegetation (cont'd)

Bog Slopes

Floristic Composition

Sedge Layer (20-40 cm)

| | |
|---|---|
| Scirpus cespitosus 3.2 | Carex oligosperma 2.2 |
| Eriophorum angustifolium 1.2 | Carex exilis 1.2 |
| Eriophorum virginicum + | Carex limosa + |
| Chamaedaphne calyculata 2.1 | Sarracenia purpurea 1.1 |
| Ledum groenlandicum 1.1 | Andromeda glaucophylla 1.1 |
| Kalmia polifolia + | Kalmia angustifolia + |
| Betula pumila + | Betula michauxii + |
| Calamagrostis inexpansa 2.1 | Myrica gale 1.1 |
| Picea mariana + | Larix laricina + |
| Gaylussacia dumosa 1.2 | |

Herb Layer (10-20 cm)

| | |
|---|---|
| Smilacina trifolia 1.1 | Drosera rotundifolia 1.1 |
| Empetrum nigrum 2.1 | Solidago uliginosa 1.1 |
| Aster nemoralis 1.1 | Aster radula 1.1 |
| Calopogon pulchellus 1.1 | Habenaria dilatata 1.1 |
| Habenaria blepharidiglottis 1.1 | Coptis groenlandica 1.1 |
| Arethusa bulbosa 1.1 | |

F. Vegetation (cont'd)

Ground Layer (0-10 cm)

Vaccinium oxycoccus 1.2
Sphagnum papillosum 3.3
Sphagnum flavicomans 3.3
Sphagnum subnitens 2.2
Sphagnum rubellum 2.2
Sphagnum magellanicum 2.2
Sphagnum pulchrum 1.2
Cetraria islandica 1.2
Cladonia arbuscula 1.2
Cladonia rangiferina 1.2
Cladonia alpestris +

Pools and Ponds

Floristic Composition

Floating Aquatics

Nuphar variegata 2.1
Nymphaea odorata 1.1
Utricularia intermedia 2.1
Utricularia cornuta 1.1

Sub-Aquatic Margin

Rhynchospora alba 3.2
Drosera intermedia 2.1
Andromeda glaucophylla 2.1
Chamaedaphne calyculata 1.1
Sphagnum torreyanum 2.2
Sphagnum cuspidatum 3.3
Cephalozia connivens 2.2
Sphagnum pulchrum 1.2
Carex limosa 1.2

F. Vegetation (cont'd)

The development of the Deer Grass-Sphagnum Bog Complex is strongly controlled by climate (ie. high moisture surplus, high humidity, strong winds and cool temperatures) and poor drainage due to the physical properties of the soils, as well as topography.

Vegetation Type II - Balsam Fir - Sedge Forests

The Balsam Fir - Sedge Forest occurs between moraine hummocks where organic soils have accumulated in the presence of stagnant groundwater. However, the origin of these deposits cannot be solely explained in terms of poor drainage due to topographic confinement. Bog complexes in the study area occupy a similar topographic position. It appears that these fen peats received slightly better drainage in their initial stage of development favouring the dominance of more nutrient demanding sedges and herbs characteristic of these vegetation types. In more recent times, peat accumulations have risen to the point where the surface layer is sufficiently removed from the water table to permit the establishment of existing forest stands.

F. Vegetation (cont'd)

Peat in the surface and middle tiers have 80-90% organic matter and up to 98% organic matter in the bottom tier. The peat is mesotrophic (pH 3.15 to 3.95) and has a moisture retention capacity of 6-10%. The water table is 20-50 cm from the surface in early spring, however, root penetration beyond this depth indicates that it may be 50-100 cm during the growing season. The soils do not thaw until late spring. Balsam fir forms the dominant cover in this habitat and black spruce is co-dominant. Both species are draped with a luxuriant growth of Old Man's Beard (Usnea longissima) indicating the high humidity of the forest understory.

Floristic Composition

(Tree Layer 5-8 cm)

| | |
|---|---|
| Abies balsamea 3.1 | Picea mariana 2.1 |

Epiphytes

| | |
|---|---|
| Usnea longissima | Sphaeophorus fragilis |
| Hypogymnia physodes | Platismatia tuckermanii |

Dwarf Shrub Layer (50-100 cm)

| | |
|---|---|
| Kalmia angustifolia 2.2 | Nemopanthus mucronata 1.2 |
| Ledum groenlandicum | Osmunda cinnamomea 2.2 |

F. Vegetation (cont'd)

Abies balsamea 3.1
Picea mariana + .1
Viburnum cassinoides 1.2
Cornus stolonifera 1.1
Calamagrostis canadensis 1.2

Herb Layer (10-40 cm)

Clintonia borealis 1.1
Cornus canadensis 2.1
Rubus chamaemorus +
Coptis groenlandica 1.1
Carex rostrata 1.2
Ranunculus repens +
Carex trisperma 3.2

Ground Layer (0-10 cm)

Gaultheria hispidula 2.2
Hylocomium splendens 4.4
Pleurozium schreberi 3.3
Ptilium crista-castrensis 2.2
Dicranum scoparium 1.2
Bazzania trilobata 1.2
Sphagnum nemoreum 4.4
Sphagnum russowii 3.3
Sphagnum girghensohnii 2.2
Sphagnum fallax +
Sphagnum magellanicum +
Cladonia arbuscula 1.2
Cladonia mitis 2.2
Cladonia rangiferina 2.2
Cladonia cornuta 1.2

F. Vegetation (cont'd)

Vegetation Type III - Pleurozium Balsam Fir Forests

The Pleurozium Balsam Fir Forest is widely distributed throughout the slopes and summits of moraine ridges within the proposed park. Balsam fir is the dominant species with 90-95% cover. Black spruce and white birch are co-dominant and constitute a minor component of this forest type. Herbs and ericaceous dwarf shrubs are scattered-to-absent.

Floristic Composition

Tree Layer (8-12 m)

| | |
|---|---|
| Abies balsamea 4.1 | Betula papyrifera 1.1 |
| Picea mariana 1.1 | Picea glauca +.1 |

Herb Layer (10-20 cm)

| | |
|---|---|
| Cornus canadensis 1.1 | Abies balsamea +.1 |
| Gaultheria hispidula 1.1 | Pyrola secunda +.1 |

Ground Layer

| | |
|---|---|
| Pleurozium schreberi 4.4 | Bazzania trilobata +.2 |
| Hylocomium splendens 2.2 | Polytrichum commune +.1 |

F. Vegetation (cont'd)

| | |
|---|---|
| Ptilium crista-castrensis 1.2 | Cladonia cristatella +.1 |
| Dicranum majus 1.2 | Cladonia rangiferina +.1 |
| Dicranum scoparium 1.2 | Peltigera aphthosa +.1 |
| Dicranum undulatum 1.2 | |

As far as the future growth of vegetation is concerned, it is felt that the following is a logical scenario which is likely to occur as a result of development.

- The water table over the entire site will be lowered. Where this occurs in the area of a bog complex, a drier vegetation community will establish. Near the bog margin, the Black Spruce-Sphagnum forest will expand toward the bog centre, thus changing the area into a drier more functional space for park use.

- In the Type II Vegetation area, the lowering of the water table will result in a development of the area to a forest which is floristically similar to the Balsam Fir-Birch Forest. Since Balsam Fir regeneration is far superior to Black spruce, cutting and windthrowing which may occur in specific areas is unlikely to change the nature of this forest.

F. Vegetation (cont'd)

- The park development will unlikely have a serious impact on the Type III Vegetation area. This forest is relatively stable and should not appreciably change unless severely disturbed. Windthrowing and cutting may create seral stages because many of the softwood dominants are at or near maturity. The understory of existing windthrows is adequately stocked with balsam fir seddlings and regeneration should proceed toward the original forest cover.

3. THE PRESENT AND FUTURE ENVIRONMENT (cont'd)

G. Fish and Wildlife

(1) Fish

A survey will be conducted in July to determine the number of trout in Hender's Brook and, in particular, to determine if any trout migrate downstream of the proposed dam site. Should this prove to be the case, provision will be made to incorporate a fishway in the construction of the dam. This fishway will meet Federal Fisheries and Oceans design standards. Furthermore, provision will be made in the design of the road crossing on Hender's brook, to use an arch-type culvert thereby reducing the impact on the stream bed.

A survey will also be conducted in the Salmonier River in July to determine the juvenile salmon population. This survey will be used as a base to compare subsequent surveys in future years to determine if this development has had an impact on the salmon population.

Statistics shown in table 10 indicate the number of fish taken annually from the Salmonier River since 1953.

TABLE 4

Angling Statistics - Salmonier River

RIVER: SALMONIER RIVER CODE: 28016900

| YEAR | EFFORT ROD DAYS | GRILSE <2.7KG | SALMON >2.7KG | TOTAL CATCH | CUE | PERCENT GRILSE |
|---|---|---|---|---|---|---|
| 1953 | 2015 | 1471 | 4 | 1475 | 0.73 | |
| 1954 | 889 | 388 | 5 | 393 | 0.44 | 100 |
| 1955 | 881 | 390 | 0 | 390 | 0.44 | 100 |
| 1956 | 1153 | 764 | 0 | 764 | 0.66 | 100 |
| 1957 | 1053 | 494 | 1 | 495 | 0.47 | 100 |
| 1958 | 991 | 480 | 4 | 484 | 0.49 | 99 |
| 1959 | 1641 | 663 | 0 | 663 | 0.40 | 100 |
| 1960 | 1471 | 237 | 2 | 239 | 0.16 | 100 |
| 1961 | 949 | 261 | 0 | 261 | 0.28 | 100 |
| 1962 | 1318 | 448 | 1 | 449 | 0.34 | 100 |
| 1963 | 1662 | 865 | 0 | 865 | 0.52 | 100 |
| 1964 | 2104 | 793 | 0 | 793 | 0.38 | 100 |
| 1965 | 1945 | 929 | 0 | 929 | 0.48 | 100 |
| 1966 | 1278 | 469 | 0 | 469 | 0.37 | 100 |
| 1967 | 1909 | 371 | 0 | 371 | 0.19 | 100 |
| 1968 | 2123 | 618 | 0 | 618 | 0.29 | 100 |
| 1969 | 2508 | 888 | 3 | 891 | 0.36 | 100 |
| 1970 | 3271 | 1096 | 0 | 1096 | 0.34 | 100 |
| 1971 | 3024 | 848 | 0 | 848 | 0.28 | 100 |
| 1972 | 3042 | 790 | 0 | 790 | 0.26 | 100 |
| 1973 | 3938 | 1336 | 1 | 1337 | 0.34 | 100 |
| 1974 | 4257 | 981 | 1 | 982 | 0.23 | 100 |
| 1975 | 5468 | 1330 | 1 | 1331 | 0.24 | 100 |
| 1976 | 4221 | 769 | 2 | 771 | 0.18 | 100 |
| 1977 | 3231 | 460 | 1 | 461 | 0.14 | 100 |
| 1978 | 2393 | 367 | 1 | 368 | 0.15 | 100 |
| 1979 | 1898 | 539 | 2 | 541 | 0.29 | 99 |
| 1980 | 2609 | 1068 | 6 | 1074 | 0.41 | 99 |
| 1981 | 2090 | 622 | 1 | 623 | 0.30 | 100 |
| 1982 | 3123 | 713 | 4 | 717 | 0.23 | 99 |
| 1983 | 3867 | 1031 | 3 | 1034 | 0.27 | 100 |
| 1984 | 3514 | 873 | 1 | 874 | 0.25 | 100 |

Source: Federal Fisheries and Oceans

G. Fish and Wildlife (cont'd)

(ii) Wildlife

The project site does not appear to be of very great importance to waterfowl; there are no good marshes and no ponds. The Salmonier River is narrow and while there are a few islands, there are no sections of grassy shoreline so important for waterfowl production.

The species of waterfowl which may be present (and possibly breeding) on the project site are Canada Goose (Branta canadensis), Black Duck (Anas rubripes) and Green-winged Teal (Anas carolinensis). In particular, the Black Duck, which prefers wilder and more isolated sites, may breed on Hender's Brook.

The project region has more waterfowl than does the site itself. There are a number of ponds and even some small marshy areas within 2-3 km of the site and these likely support a limited number of breeding waterfowl (species mentioned above). Also, sections of the Salmonier River both upstream and downstream from the site have additional potential waterfowl breeding habitat. However, even the region around the site is not noted for high waterfowl numbers. Because of the limited

G. Fish and Wildlife (cont'd)

(ii) Wildlife (cont'd)

amount of wetlands, the region must be classed as marginal waterfowl habitat. The waterfowl population on the Avalon Peninsula is not so high that the birds are forced to use the more marginal habitat around the proposed development site.

Timing

Waterfowl that might be present on the project site in the region around it would begin to arrive by early or mid-April, depending on break-up of rivers and ponds. In general, the nesting and brood rearing periods extend from about early May to late August or early September, with moult occurring from mid-June to late August. It is not expected that the project site or the adjacent region represents important mirgration or staging habitat; most of this activity likely takes place on the coast, in Salmonier Arm for example, or elsewhere in St. Mary's Bay. By September, most waterfowl have probably vacated the project site and adjacent region, and have joined the staging birds in the bay prior to the southward migration.

G. Fish and Wildlife (cont'd)

(ii) Wildlife (cont'd)

Other Avifauna

Approximately 35 species of other birds are probable nesters in the project site or in the areas adjacent to it (Table 5). All species may not be present in any given year, and it is possible that species other than those listed may nest in the area from time to time.

The species list presented in table 5 was compiled by J. Pratt, a biologist and long-time resident of the area. Other than to present this list, we feel that little additional comment is necessary on this element of the avifauna resource.

This species list will be made available to interested guests and day users of Governor's Park. In time, this should lead to the development of a more comprehensive list for the Park.

G. Fish and Wildlife (cont'd)

(ii) Wildlife (cont'd)

Timing

Most of the birds in Table 5 arrive in the area in May and depart again by October. However, approximately 15 of the species listed in Table 5 overwinter (some in small numbers) in the general area of the proposed development. These overwintering birds are indicated with an asterisk in the table.

TABLE 5

NESTING BIRD POPULATION

| | |
|---|---|
| American Bittern | *Botaurus lentiginosus* |
| Merlin | *Falco columbarius* |
| *Ruffed Grouse | *Bonassa umbellus* |
| *Common Snipe | *Capella gallinago* |
| Greater Yellowlegs | *Totanus melanoleucus* |
| Spotted Sandpiper | *Actitis macularia* |
| *Hairy Woodpecker | *Dendrocopus villosus* |
| *Downy Woodpecker | *Dendrocopus pubescens* |
| *Common Flicker | *Colaptes auratus* |
| Yellow-bellied Flycatcher | *Empidonax flaviventris* |
| Tree Swallow | *Iridoprocene bicolor* |
| *Belted kingfisher | *Megaceryle alcyon* |
| *Gray Jay | *Perisoreus canadensis* |
| *Common Crow | *Corvus brachyrhynchos* |
| *Black-capped Chickadee | *Parus atricapillus* |
| *Boreal Chickadee | *Parus hudsonicus* |
| American Robin | *Turdus migratorius* |
| Hermit Thrush | *Hylocichla guttata* |
| Swainson's Thrush | *Catharus ustulatus* |
| Grey-cheeked Thrush | *Hylocichla minima* |
| *Golden-crowned Kinglet | *Regulus satrapa* |

TABLE 5 (cont'd)

NESTING BIRD POPULATION

| | |
|---|---|
| Ruby-crowned Kinglet | Regullus calendula |
| Black-and-white Warbler | Mniotilta varia |
| Yellow Warbler | Dendrocia petechia |
| Magnolia Warbler | Dendroica magnolia |
| Yellow-rumped Warbler | Dendrocia coronata |
| Blackpoll Warbler | Dendrocia striata |
| Northern Waterthrush | Seiurus noveboracensis |
| Mourning Warbler | Opororanis philadelphia |
| Common Yellowthroat | Geothlypis trichas |
| Wilson's Warbler | Wilsonia pusilla |
| American Redstart | Setophaga ruticilla |
| Rusty Blackbird | Euphagus carolinus |
| *Purple Finch | Carpodacus purpureus |
| *Pine Grosbeak | Pinicola eneucleator |
| *Dark-eyed Junco | Junco hyemalis |
| *White-throated Sparrow | Zonotrichia leucophyrs |
| Swamp Sparrow | Melospinza georgiana |
| Fox Sparrow | Passerella iliaca |

*Overwintering species

G. Fish and Wildlife (cont'd)

In addition to the 15 species identified in the table, there are five other birds that overwinter (but do not nest) in the area. These are:

| | |
|---|---|
| Evening Grosbeak | Hesperiphona vespertina |
| Common Redpoll | Acanthus flammea |
| Pine Siskin | Spinus pinus |
| Red Crossbill | Laxia curvirostra |
| White-winged Crossbill | Laxia leucoptera |

Since it is proposed to operate Governor's Park on a year-round basis, the presence of approximately 20 species of overwintering birds may be an added attraction to some of the guests.

Upland Small Game

Two species of upland small game occur at the project site and in the area adjacent to it. These are Ruffed Grouse (Bonasa umbellus) and snowshoe hare (Lepus americanus).

Ruffed Grouse are most commonly found in deciduous forests or in mixed deciduous/coniferous forests.

G. Fish and Wildlife (cont'd)

Forest edges are favourite haunts, as are fields with higher growth for cover. In the project area, numbers of Ruffed Grouse are low but stable (M. Pitcher, Wildlife Division, pers. comm.).

The snowshoe hare presently occurs throughout the area. It is primarily an animal of the coniferous forest where it reaches highest densities around cutovers and other areas supporting vegetation in the early stages of succession. Hare populations undergo the familiar 10-year cycle pattern, and at present appear to be recovering from a low.

Furbearers

Interviews with R. Burns and M. Pitcher (Wildlife Division) at the Salmonier Nature Park reveal that furbearer populations in the project area are low. Lynx (Lynxcanadensis), are present but numbers are low at present. Ermine (Mustela erminea) are also present in low numbers. Three basically aquatic furbearers: beaver (Castor canadensis), otter (Lontra canadensis), and mink (Mustela vison) occur in moderate numbers. The otter is found in unpolluted waters where fish are abundant, and in the project area would most often be found in the Salmonier River. The mink is equally at home on land or in the water and can subsist quite well on fish or small mammals (eg. mice).

G. Fish and Wildlife (cont'd)

Beaver are probably less abundant than the other two aquatic species because of habitat limitations, primarily the general absence of subclimax deciduous, and submergent and emergent vegetation.

Big Game

The moose (Alces alces) is the only big game species resident in the project area. Moose are animals of the coniferous forest, particularly where areas of second growth occur and where swamps and lakes are present.

The last moose census in Management Areas 33 and 36 (which includes the Governor's Park area and the region adjacent to it on the Salmonier Line) were conducted by the Newfoundland Wildlife Division in 1978 (Area 33) and 1982 (Area 36). At that time an average estimated density of moose in the two areas was 0.9 animals per square kilometre. This density is among the highest for any of the Avalon Peninsula Moose Management Areas.

This high density is reflected in the number of moose sightings on the Salmonier Line. From May to the end

G. Fish and Wildlife (cont'd)

of September, staff of the Salmonier Nature Park have averaged two moose observations per day while travelling to work at the park. Harvest trend information available from the Wildlife Division for the period 1980-84 is further evidence that the moose population is high in the Salmonier Line area; this harvest information indicates that the population is stable (Area 33) and increasing (Area 36).

Suitable winter range is an important element of good moose habitat, and coniferous forest and river valleys usually meet this requirement. However, the only known moose yard in the general project area is approximately 8 km west of the proposed Governor's Park site (M. Pitcher, Wildlife Division, pers. comm.).

Caribou (Rangifer tarandus) are not resident in the project area although an individual animal may wander through the area on rare occasions (E. Mercer, Wildlife Division, pers. comm.). However, the general project area does represent potential caribou range, but at present the range of the Avalon herd does not approach closer than 3-5 km of the proposed development. The

G. Fish and Wildlife (cont'd)

closest calving range is at Chisel Hill, 3-5 km to the east in the Avalon Wilderness Area. This is a minor calving range used by a small percentage (less than 10%) of the Avalon herd (M. Pitcher, Wildlife Division, pers. comm.). The major calving range is 6-9 km southeastward in the Wilderness Area in the vicinity of Big Pond and Franks Pond. Calving takes place from late May to late June each year.

3. THE PRESENT AND FUTURE ENVIRONMENT (cont'd)

H. Provision of Power and Telephone Services

At present, the nearest available power is about 3 km from Governor's Park. Discussions have been held with Nfld. Light and Power Co. Ltd. officials who have agreed to extend power to the Park during 1985 and 1986.

Individual telephones will be placed in all lodge rooms and chalets. As well, several other telephones will be required throughout the site. The nearest telephone service is at St. Catherine's, about 6 kilometres away and to extend service from St. Catherine's would require the construction of a pole line. In the other direction, the nearest telephone service would be about 19 kilometres away at Holyrood. When Newfoundland Light and Power Co. Ltd. extend their power lines to the site, a pole line from Holyrood to the site will be available to Nfld. Telephone Co. Ltd. Whether or not the telephone company is prepared to erect cables along this pole line or construct a new pole line from St. Catherine's, will be determined by the results of a survey to be conducted in the Salmonier Line area this summer. This survey will determine how many summer cabin dwellers would be interested in telephone service if available.

3. THE PRESENT AND FUTURE ENVIRONMENT (cont'd)

I. Pest Problems

From meetings with various Government Departments, the following have been identified as possible pest problems:

(1) Black flies and mosquitoes
(2) Squirrels
(3) Field mice and rats
(4) Shrews
(5) Beavers

There is a chemical that can be used as a spray for black flies and mosquitoes without any detrimental effect to wildlife. Apparently, this product has been used with successful results and without any environmental impact, in the community of Happy Valley - Goose Bay, Labrador. Without the experience of being in this area when these flies are prevalent, the decision on whether or not a chemical spray will be used, will have to wait until after this summer's experience. If these flies are considered such a problem that spraying must be considered, then all the

necessary Government Departments will be contacted to ensure that this process meets their approval, before any spray program is introduced. If spraying is decided upon, it will be carried out by a liscensed applicator.

Precautions will be taken in building construction to ensure that pests such as squirrels, mice, rats, shrews, or other mammals are prevented from entering. If any of these pests become a problem, discussions will be held with the Wildlife Division to seek their assistance, guidance or advice.

The activities of beavers, if a problem, will be curtailed by constant surveillance of park personnel.

## 4. PREDICTED ENVIRONMENTAL IMPACTS

### A. Soil Wash

The occurrence of soil wash both during and after construction has received very serious consideration in this Environmental Impact Statement. During construction the major occurrence of soil wash will take place with the construction of the dam on Hender's Brook. To a lessor extent soil wash will occur as a result of the road construction, the lodge site, Hender's Brook crossing and other miscellaneous park infrastructure. After construction, soil wash will occur as a natural result of developed areas on site.

#### (i) Dam Construction

During construction of the dam and intake, soil wash is expected to be the most severe. It is estimated that an area of about 1000 square metres will be cleared and grubbed to provide an impounding reservoir for water storage. Although silting of Hender's Brook during this phase is a certainty, steps will be taken to reduce its impact on the fish habitat which may exist in Hender's Brook and its impact on the Salmonier river into which it flows. These will include:

A. Soil Wash (cont'd)

- Carrying out construction of the dam and reservior during periods of very low flows in the brook.

- Preventing the Contractor from working at the dam site during and immediately after heavy rainfalls.

- Consideration of a coffer dam upstream of the proposed site such that water is further impounded in one of the small ponds above; this will further reduce the flow in the brook.

- Avoiding the use of heavy equipment in the brook. Where possible, excavations will be carried out by an excavator operating from shore.

- Immediately removing excavated materials from the banks of the brook and reservoir area to prevent soil wash back into the brook during heavy rains.

- Scheduling work such that this phase of the project will be completed before the critical spawning period begins.

A. Soil Wash (cont'd)

In addition to the foregoing, we have considered diverting Hender's Brook around the actual dam and reservoir site, however, due to topographical considerations, we have deemed this to be impractical.

Other measures, such as the temporary impounding of the brook downstream to produce settling basins or the use of materials to provide filtering of soil wash into the brook will be considered during the design process in conjunction with the concerned regulatory agencies.

The proponent is committed to forwarding all preliminary design and conceptual drawings to the concerned regulatory agencies for comments as they are developed. Furthermore, the proponent will meet with the Department of Fisheries and Oceans to determine appropriate mitigation stratagies in relation to Hender's Brook.

A. Soil Wash (cont'd)

(ii) Construction of Roads

It is proposed that the upgrading of the main access road and the construction of the campsite roads will take place during the fall of this year. The soil wash problem associated with the road construction is expected to be less severe than with the dam construction.

To reduce its impact, it is proposed that once again, contractors will have restrictions on the type of work they may do during and after heavy rainfalls. In addition, every effort will be made to reduce the flow in roadside ditches which would carry water directly to existing streams, such as Hender's Brook. This will be done by diverting water away from roadside ditches and into lower lying areas of the site where silt and other debris may be filtered out. To further reduce soil wash, equipment operators will be restricted in their movements within the work area and every effort will be made to ensure no unnecessary disturbance of the site occurs.

A. Soil Wash (cont'd)

(iii) Lodge Site

Because of the location of the lodge, soil wash into Hender's Brook will not be a problem. Nevertheless, earth works carried out at the lodge site may have an impact on the Salmonier River located immediately below the site some 160 metres away.

In view of the fact there is a buffer zone between the river and the lodge, it is expected that soil wash through this zone will be minimal. The thick growth of vegetation and the overlying organic soil occurring through this zone will act as an excellent filter for soil wash and its overall impact will likely be negligible.

To assist in this eventuality, soil wash from the lodge site will be directed away from existing footpaths which lead directly to the river. In addition, run offs from the site will be closely monitored by site inspectors such that no "easy" route is found to the river.

A. Soil Wash (cont'd)

(iv) Hender's Brook Crossing

It is proposed to use an arch-type culvert such that the stream bed is disturbed as little as possible, thereby reducing the extent of soil wash. Backfilling operations will be closely monitored and embankments immediately stabilized so as to prevent soil wash into the brook. Other techniques, such as those being used at the dam site, will be employed.

(v) Other Park Infrastructure

As in the previous cases, earth works carried out in the location of the chalets, convenience store, parking areas, water flumes, etc. will be closely monitored by on-site inspectors. Every effort will be made to direct soil wash away from existing streams which can carry silt directly to the Salmonier River. All embankments created will be stabilized immediately and all excavations will be backfilled as soon as possible.

A. Soils Wash (cont'd)

After construction, soil wash from the developed areas will continue to be closely monitored. Landscaping carried out at or near the end of construction as well as additional landscaping carried out during operation of the park will assist greatly in reducing soil wash into the rivers. All pathways leading around the site will have drainage barriers thereby preventing rapid runoff along these trails towards the major streams. Other landscaping such as the planting of bushes, trees, rip-rapped slopes, etc. at appropriate locations throughout the site, will greatly enhance the area, as well as minimize the possible effect of soil wash into the Salmonier River.

4. PREDICTED ENVIRONMENTAL IMPACTS (cont'd)

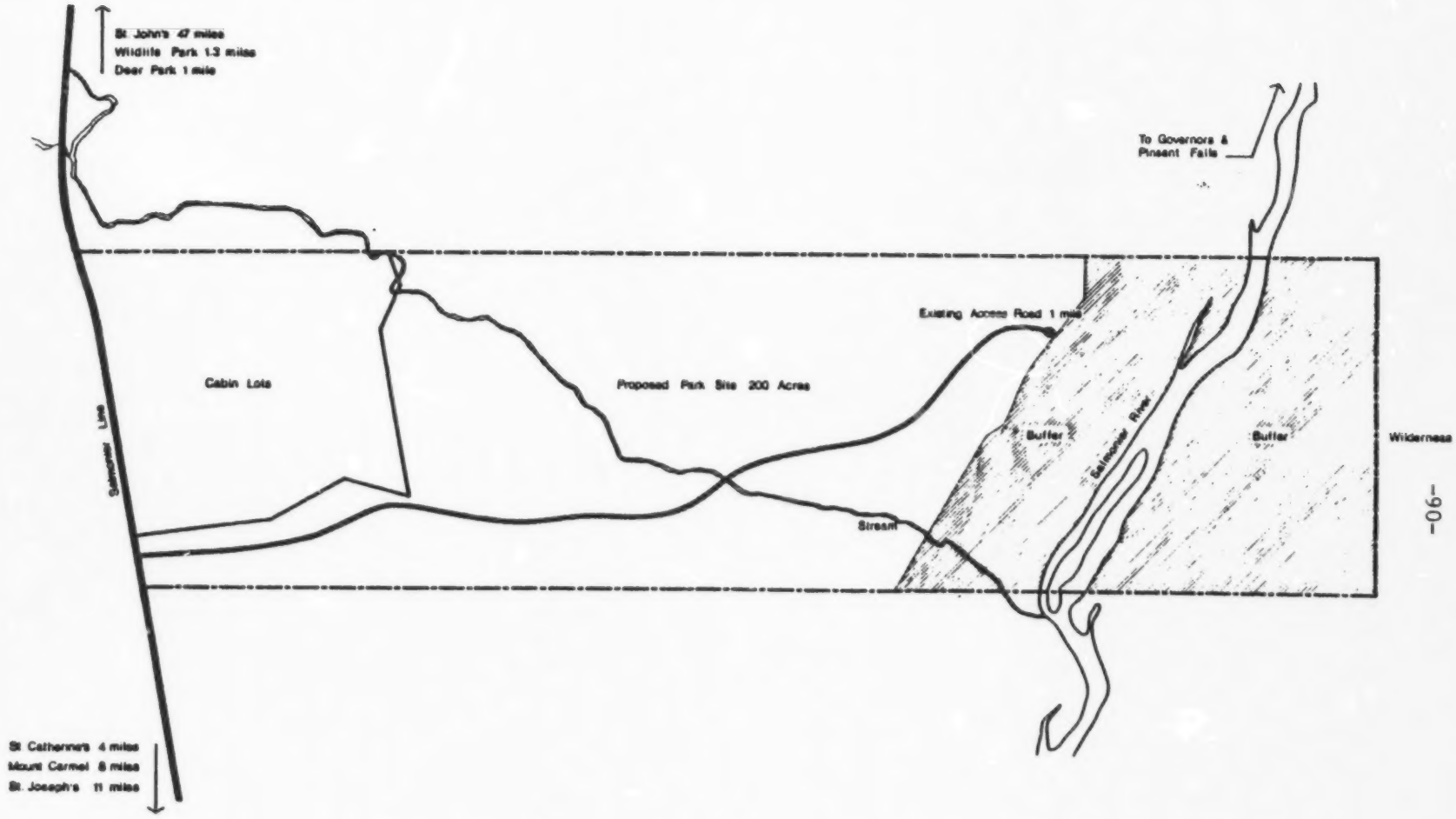
B. River Buffer Zone

As can be seen in Figure 10, the entire area of Governor's Park will be buffered from the Salmonier River by a 160 metre wide strip of undeveloped land. The only intrusion into this buffer strip will be the possible construction of sewage treatment and pumping facilities, and the existing walking trails.

As previously mentioned, the lodge will be sited on top of a ridge to take advantage of the tremendous view of the Salmonier River valley below. The most feasible and economic way of collecting sewage from the lodge is down over the ridge from where it will be pumped back over the hill to a sewage disposal area. These sewage facilities will be housed and constructed in a wooded area, out of site and out of bounds to park guests. A contingency plan to deal with overflow is included in the discussion on sewage disposal.

The existing road has been constructed down over the ridge to within 50 metres of the Salmonier River. A path has been established from the end of this road, leading directly to

FIGURE 10
RIVER BUFFER ZONE



B. River Buffer Zone (cont'd)

the Salmonier River. It is intended to cut off this road at the top of the ridge and restore the remainder to its original condition, except for controlled private access to the sewage treatment facilities.

One of the concerns of the Salmon Association of Eastern Newfoundland (SAEN), is access to the Salmonier River. While it is recognized that access to the Salmonier River is now available through this property, steps will be taken to control this access.

## 4. PREDICTED ENVIRONMENTAL IMPACTS

### C. Waste and Sewage Disposal

It is intended that sewage from the major areas of the site will drain to a single point and be passed through a secondary treatment system. (See Figure 11). From this point it will be pumped back up the site a distance of about 500 metres from the Salmonier River for ultimate discharge through a disposal field. Secondary treatment is being considered as the best choice as opposed to primary treatment for the following reasons:

(1) A better overall quality of effluent.

(2) It will result in a reduction of the size of the disposal field.

Although various types of secondary treatment systems available are still being considered, favourable consideration is being given to the use of a Rotating Biological Contactor or RBC as it is commonly called.

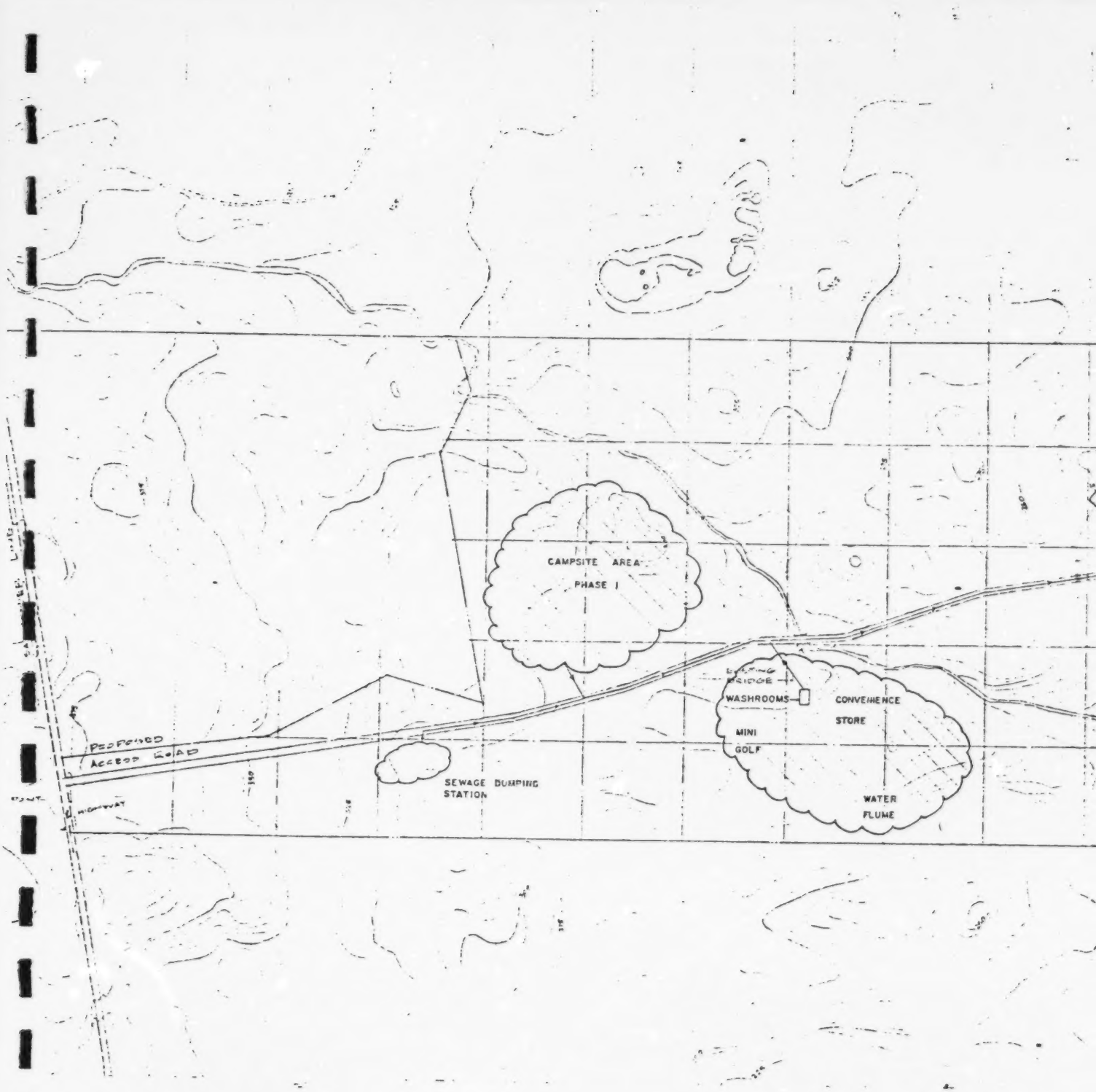

CAMPSITE AREA
PHASE I
WASHROOMS
CONVENIENCE
STORE
MINI
GOLF
WATER
FLUME
SEWAGE DUMPING
STATION
PROPOSED
ACCESS ROAD
LEGEND
FORCE MAIN
GRAVITY SEWER

FIGURE 11

CONSULTING ENGINEERS

fga Follett Gosse & Associates Limited Consulting Engineers

PROJECT
PROPOSED SEWER SYSTEM
GOVERNORS PARK

DWG TITLE
SITE AREA LAYOUT

| DWN BY | DATE | DWG NO |
|---|---|---|
| | 85 - 06 - 03 | PR - 2 |

C. Waste and Sewage Disposal (cont'd)

Because of the high water table, poorly draining soil and site topography, it will be necessary to construct a moundal disposal field using imported material. Costs associated with the construction of the disposal field are expected to be quite high and because of this and other topographical considerations, an attempt will be made to reduce the size of the field as prudently as sound engineering design will allow.

The sewage pumping station will consist of two sewage pumps each of which will be capable of handling peak flow rates. The holding chamber will be designed to prevent a septic condition from occurring and will include an overflow into a holding basin constructed adjacent to the pumping station.

In the event of a power failure, the water supply to the site will be immediately cut off thereby reducing sewage flows into the system to near zero. In addition the chamber in the pump station as well as the holding basin will provide a minimum of six hours storage at average flow conditions. The holding basin will be pumped back into the system using gasoline driven pumps which will be kept at the site.

C. Waste and Sewage Disposal (cont'd)

The piping system will consist of 200 mm and 100 mm diameter PVC sewer pipe which will be used for the gravity main and force main respectively. Manholes will be provided at all intersections and bends in the gravity collection line.

The picnic site area will not be included in the piped collection system as it is intended to use privies.

Solid Waste Disposal

The Town Council of Mount Carmel - Mitchell's Brook - St. Catherine's has agreed to permit the use of their dump site for disposal of solid waste from the Governor's Park development. An agreement will be signed between the proponent and the Council regarding user rates to be paid for this service. The proponent will arrange for garbage collection at the site and disposal at the dump site.

Chlorinated Water Disposal

During discussions with various Government Departments prior to Environmental groups submission of this EIS, a concern was expressed regarding the discharge of chlorinated water from the swimming pools.

C. Waste and Sewage Disposal (cont'd)

Although it is expected that swimming pools will not normally be drained, in the event that this becomes necessary, chlorine residuals will be removed from the water prior to discharge.

In the case of the indoor swimming pool, discharge will be on an intermittent basis into the sewage disposal system so as not to overload the system. Discharge from the outdoor pool will be pipe drained directly to Hender's Brook.

Residuals will be removed either by exposing the water to direct sunlight where possible, or by the addition of neutralizing chemicals such as sodium metabisulfite.

In addition to the removal of chlorine residuals, pH levels of the chlorinated water will be monitored and adjusted by chemical treatment in the event that the swimming pools must be drained.

All chemicals will be stored on site and park staff will be trained in their use and handling.

4. PREDICTED ENVIRONMENTAL IMPACTS (cont'd)

D. Salmon Fishing

It would be foolhearty to suggest that this tourist facility will not increase the number of salmon fishermen on the Salmonier River. As a matter of fact, the Salmonier River will possibly be one of the drawing features to attract tourists. It is, however, in the proponents best interest to ensure that depletion of the salmon stocks in Salmonier river does not become a problem.

In this regard, the proponent will carry out a survey of the salmon population this year. This survey will be carried out by a person qualified to do such work, and who is acceptable to the Federal Department of Fisheries and Oceans. Furthermore, the proponent is prepared to assist the Federal Department of Fisheries and Oceans to carry out annual surveys to see if there is any serious depletion of salmon stocks, as a result of the opening of Governor's Park.

The proponent is prepared to participate in any management program proposed by Federal Fisheries and Oceans, which would be beneficial to all concerned.

4. PREDICTED ENVIRONMENTAL IMPACTS (cont'd)

E. Wildlife Population

In the first instance, the construction phase of the proposed Governor's Park project offers the potential for some negative impact to the wildlife resource. However, as the discussion on the following pages will show, construction impacts (if any) are likely to be minor and short duration. This project site, with its poor forest cover and very irregular terrain, is marginal wildlife habitat. This, together with the small size of the site, suggests that wildlife species and numbers residing entirely on the site are few, and forced movement away from the site because of development will be minimal and of no real consequence.

Of somewhat more importance is the possible barrier effect that the linear-shaped developed site may have on the movement of some wildlife species such as moose. This will be considered later in this section.

Perhaps the largest concern in this development is the potential pressure that the large numbers of guests may place on the wildlife and on the land base around the project site. Later in this section we will discuss the potential impact on the Avalon Wilderness Area and on the Salmonier Nature Park.

E. Wildlife Population (cont'd)

First, we will consider the impact on the various elements of the wildlife resource.

Waterfowl

Any waterfowl that do occur at the project site are likely to be most seriously affected by construction activities (noise, human presence) that disturb nesting pairs or disrupt normal behaviour during the breeding-moulting period (early May to late August). However, because of low densities (both on the site and in the adjacent area) production losses form disturbance or habitat degradation should be minimal, and the impact on regional waterfowl populations should be low.

If waterfowl breeding areas are discovered on the project site, if possible, a vegetation screen of up to 50 m will be left undisturbed around the breeding area.

Other Avifauna

It is expected that the construction phase of the proposed development will cause a large percentage of the breeding bird population to abandon the site for the short term (until the

E. Wildlife Population (cont'd)

major construction activity is completed), and then to recolonize the altered habitat gradually. However, it is possible that some elements of the avifauna may not return; certain species (eg. some songbirds) are very wary of man's presence. If this happens it will be unfortunate, but on a regional basis the composition of the avifauna should not be affected.

One species which is likely to be attracted to the proposed development is the Starling (Sturnus vulgaris). This pest, which out-competes native species for food and crowds out smaller and less agressive species, has already spread to the Salmonier Nature Park (K. Moore, pers. comm.). The Starling will not be encouraged at the site, however, if they should become a problem, discussions will be held with wildlife officials to determine the possible methods to resolve this problem.

Where it is practical and possible, tree cutting and clearing will be carried out in the non-nesting period (fall and winter). If clearing must be undertaken during nesting, nests encountered will be left undisturbed where this is possible. A particular effort will be made to avoid destruction of trees that contain cavities used for nesting by particular species

E. Wildlife Population (cont'd)

(eg. woodpecker). Cavity-nesting birds use the same nest year after year, and some species of woodpeckers are fairly compatible with human presence. If development does not disturb their nesting cycle, they are likely to return to the site the following year.

Any nests discovered and preserved will not be promoted as attraction for the guests. We recognize that such action will jeopardize the success of these sites, even though the activities of the eager guests viewing the nest may be well intentioned. Furthermore, should a concentrated area of nesting activity be located, we will consider an alternate approach to utilizing that site in order to offer protection to the nests.

Uncovered trash containers will attract Starlings, Gulls, Crows, and Ravens to the site. While some of these will be present anyway, it will be detrimental to the avifauna to attract large numbers of these species. Consequently, all garbage will be secured in such a way as to prevent its being used as food by scavenging birds.

Three mitigative measures will be taken to minimize the effect that habitat alteration will have on the project site avifauna:

E. Wildlife Population (cont'd)

- a number of areas of thick shrubs and understory (eg. Kalmia, alders, etc.) will be left undisturbed since this habitat provides shelter and nesting sites for particular species of birds.

- mixed woods (eg. birch/fir, alder/spruce) are not common at the site or in the region generally, and therefore it will be more difficult for displaced birds nesting there to find such habitat elsewhere. Areas of such habitat will be preserved within the site.

- wherever possible, a vegetation screen will be maintained around any sensitive or critical water bodies (eg. nesting areas).

Upland Small Game

The paucity of information on upland small game distribution and status in the project area limits the extent of impact predicition. However, the development of the Governor's Park site will create clearings and forest edge, both of which are commonly used habitat for snowshoe hare and Ruffed Grouse. The positive benefit of creating this habitat likely will be at least partially offset by the human and other activity at

E. Wildlife Population (cont'd)

the site. Overall, the proposed development is not likely to have any substantial effect on regional populations of upland small game species, and may even have something of a positive effect.

There are few practical mitigative measures for reducing impact on upland small game habitat. We propose leaving any mixed forest in as undisturbed a state as possible, and retaining some areas of wild shrubs intact.

Furbearers

Construction of the proposed development is unlikely to have any negative effect on either terrestrial or aquatic furbearers since numbers are quite low in this generally unsuitable habitat.

Big Game

The noise and human activity associated with the construction phase of the proposed development may cause moose nearest the site to temporarily withdraw. However, the project site is so limited in size that the likelihood of more than one moose being present on it is low. Thus the direct negative impact of the construction phase on moose is either non-existent or

E. Wildlife Population (cont'd)

low.

There is some possibility that the operational phase of the development may have a negative impact on moose. There are two considerations here which warrant further examination. First is the possibility that the site may act as a barrier to moose movement through the area. Large numbers of moose are known to travel along the edges of the Salmonier Line, frequently back from the road to avoid detection. The linear project site lies perpendicular to the road, and the developed site could interfere with the movements of travelling moose. However, we feel that although this may occur, it will not be a serious problem. Moose will either pass through the development at night when it is quiet (moose are well known for entry into cottage development areas), or will by-pass the development, using the Salmonier Line or the Salmonier River valley.

The second consideration relative to moose impact is associated with the first; moose that come upon the developed site may be attracted to the lawns and planted shrubs to the point of becoming a pest. Should this happen, advice will be sought from the Newfoundland Wildlife Division.

E. Wildlife Population (cont'd)

Caribou are not resident in the project area and will not be affected by the construction phase. While the general region of the development may represent potential caribou range, the small size of the project site itself means there will be minimum range destruction. The development of the site will therefore have insignificant impact on caribou, either on the animals directly, or through the elimination of potential range.

The caribou calving area has been identified by wildlife officials as being in the Avalon wilderness Area, about 2 to 3 kilometres south of the Salmonier river. Access to the south side of Salmonier river will not be provided in this development, therefore, people will not be able to reach the south side of the river unless they boat, swim or wade. Only the more adventurous will attempt such an undertaking and even then, having reached the other side, will be confronted with a 2 to 3 kilometre hike through heavily wooded and very steep terrain.

It is considered that these natural barriers will prevent any serious encroachment into the caribou calving area.

4. PREDICTED ENVIRONMENTAL IMPACTS (cont'd)

F. Salmonier Nature Park

Discussions have been held with Mr. Kevin Moore, Manager of the Salmonier Nature Park, about the possible impact the influx of visitors to Governor's Park will have on the Salmonier Nature Park.

At present, the Salmonier Nature Park handles about 35,000 summer time visitors with a peak attendance of about 2,000 on Sundays, when the weather is good. Mr. Moore advises that improvements will be made to the Salmonier Nature Park this summer which will allow the park to accomodate more people. He does not foresee the Governor's Park development as having any serious impact on the Salmonier Nature Park.

Should the numbers of people wishing to enter the Salmonier Nature Park as a result of the Governor's Park development increase dramatically, then an effort will be made to coordinate visits to the Nature Park during evenings and other non-peak periods.

4. PREDICTED ENVIRONMENTAL IMPACTS (cont'd)

G. Storage of Chemicals

It is proposed that all chemicals be stored in a room within the convenience store. Thus far, chemicals which have been identified for possible use include:

- Insecticides
- Pesticides
- Chemical agents for swimming pool
- Fertilizers and other garden chemicals
- Calcium chloride for dust control

It is intended that the chemical storage room be a separate room, heated, dry and well ventilated. It will be constructed of standard building materials with a vandal-proof door. Chlorine chemicals for use in the water supply system will be housed in the specially designed chlorination building located near the dam site.

Propane which may be used in the kitchens of both the lodge and the convenience store/restaurant will be enclosed in a chain link fence and will meet local, provincial and federal regulations.

Oil storage on site is not being considered as it is intended that all buildings will be heated electrically.

4. PREDICTED ENVIRONMENTAL IMPACTS (cont'd)

H. Quarry Sites

No quarry sites have been identified on the development site. It is intended that all material for use in the works will be imported from other areas along or near the Salmonier Line. Contact has been made with the Provincial Department of Transportation in order to solicit their aid in the selection of suitable quarry sites.

4. PREDICTED ENVIRONMENTAL IMPACTS (cont'd)

I. Landscape Treatment

Specific details of landscape treatment have not been identified at this time. It is proposed, however, that the following types of landscape treatment will be used either during the construction stage or as an ongoing process thereafter.

- The main access road side slopes will be hydro seeded or sodded. In certain areas, low-lying shrubs and bushes are being considered as a possible method of reducing soil wash and stabilizing slopes during construction.

- The area in the vicinity of the water flumes and convenience store will be hydro seeded or sodded. Tree planting will be considered for appropriate places within this area. Consideration will be given to the mounding of soil on the lower elevation of this area to filter and direct soil wash away from Hender's Brook. These mounds would be hydro seeded or sodded, making them a pleasing and integral part of the "attraction" area.

I. Landscape Treatment (cont'd)

- The lodge area will be hydro seeded or sodded. Healthy trees which are located close to the building will be left and treated as part of the landscape. Flower beds, additional tree planting and shrubbery, all will serve to enhance the park setting and create natural buffers to soil wash. As in the case of the area of the convenience store, consideration will be given to mounding or ditching the lower area of the lodge site so as to control the direction of soil wash to those areas of the site where filtration and settling is most likely to occur.

- The main access road will be paved while the parking lots and campsite roads will remain unpaved.

- During the construction stage, dying trees and windfalls will be removed from the site. It is proposed that a continuing program of forest revitalization be undertaken as part of the overall forest management during operation.

- Trailer sites will be seeded or sodded.

- The kiddies playground area will be seeded or sodded.

I. Landscape Treatment (cont'd)

The overall impact of the development which has a very important landscaping influence, will be positive as far as the site is concerned. Whereas the existing site is wet, boggy, poorly forested with dying or decaying trees, the park development will see a tremendous revitalization of the area with new tree and plant life.

4. PREDICTED ENVIRONMENTAL IMPACTS (cont'd)

J. Dust Control

During construction, dust will be controlled by the use of both water and calcium chloride to latest Government of Canada Specifications. Levels of dust will be monitored by on-site inspectors who will order the use of dust reducing agents, as required.

Dust control after the park has opened will be treated as a continuing operational responsibility. The main access road to the site will be paved, therefore, the only area where dust may be a problem is on the campsite roads. The problem should be minimized due to the nature of these roads, that is, they are narrow, short and winding, thus effecting reduced speeds.

Like unpaved roads in other parks throughout the Province, these roads will be treated with calcium chloride on an annual basis, or as the need arises. It is intended that this chemical be stored on site in powdered form.

4. PREDICTED ENVIRONMENTAL IMPACTS (cont'd)

K. Management and Maintenance

It is intended to hire the following personnel on a full time basis for management and maintenance of the Park.

- Park Manager
- Assistant Park Manager
- 4 Maintenance & Security People
- 4 Program directors

In addition, attendants will be stationed at the pool/slide area, convenience store, and generally in key areas throughout the park. Most of these people will be employed on a seasonal basis.

An emergency evacuation plan will be devised; all personnel will be thoroughly briefed, and this plan will be posted throughout the park.

K. Management and Maintenance (cont'd)

Security and maintenance personnel will be equipped with communication devices so that they will be immediately available to attend to emergency situations.

Access to the Park will be controlled by a gate house at the main entrance. All people entering the park will be required to stop at the gatehouse and pay the necessary admission fee.

4. PREDICTED ENVIRONMENTAL IMPACTS (cont'd)

L. Avalon Wilderness Area

As previously stated in section 4 (E), access to the Avalon Wilderness Area will be controlled to some extent by natural barriers. This previous section, however, addressed the natural barriers as they relate to access by foot. A concern has been expressed regarding access by use of machines, such as all terrain vehicles and snow mobiles. Although the proponent has no control over use of such machines in the wilderness area, their use will be prohibited within the park boundaries.

Government Regulations require that anyone entering the Avalon Wilderness Area must have a permit from the Wildlife Division of the Department of Culture, Recreation and Youth. Anyone found in the area without this permit is subject to prosecution. It is suggested that it may be desireable to have these permits available in Governor's Park, not as a means of encouraging people to enter the area, but rather as a means of providing some measure of control over indiscriminant and illegal entry from the Governor's Park Development.

4. PREDICTED ENVIRONMENTAL IMPACTS (cont'd)

M. Traditional Wildlife Activities

Waterfowl

Our interviews with residents of the area suggest that there is only minor hunting effort for waterfowl on the project site and in the adjacent area. This is due to the low waterfowl densities there. There are much better places on the Avalon to hunt waterfowl. Also, much waterfowl hunting is done incidentally to ptarmigan hunting, and ptarmigan rarely occur in the project area (Wildlife Division, pers. comm.).

Upland Small Game

Local cabin owners shoot and snare Ruffed Grouse, and snowshoe hare in the project area. Hunting pressure from this source is low. Residents of the communities in Salmonier Arm and St. Mary's Bay rarely travel to the area of the proposed development to take small game.

## M. Wildlife Activities

### Furbearers

Wildlife Division personnel report that there is a very low trapping effort in the vicinity of the proposed development. The project site itself lies near the western boundary of a registered beaver trapline, but none of the beavers taken by this trapper have come from the site; the ponds and brooks to the east of the Salmonier River have been the source of most of the catch.

### Big Game

During the 1980-84 period, approximately 80% of the moose hunters in Areas 33 and 36 were successful in shooting an animal. This is higher than the province-wide average hunter success. However, the majority of the approximately 900 licenced hunters who hunted annually in these two areas since 1980 did so away to the east and southeast of the proposed development site. Only an average of 8.7 moose were taken each year in the general area of the project site.

## 5. PUBLIC PERCEPTION OF THE PROPOSED ACTION

Public meetings were held at the St. Mary's Bay communites of St. Joseph's and Mt. Carmel on January 15, 1985 and in St. John's on June 5, 1985. At each of these meetings the public were informed as follows:

(a) A phamplet describing the facilities was passed out at the entrance.
(b) A verbal presentation was made by the Project Manager.
(c) A slide show was presented by the Building Architect.
(d) A model and sketches of the proposed facilities were on display.

At the end of the presentation, the public were given an opportunity to voice their comments and/or concerns, which are hereby recorded.

### St. Joseph's and Mt. Carmel

The attendance at these meetings was approximately 120 and 170 respectively. The major concern of the people was focused on who would get the jobs available during construction and later during operation of the park. They were assured that local businesses would be given the opportunity to bid on contract work, and if outside contractors were engaged, they would be required, as far as

5. PUBLIC PERCEPTION OF THE PROPOSED ACTION (cont'd)

legally possible, to employ local labour. Furthermore, the developer would be prepared to assist in Government sponsored programs to train people from the area as operating staff.

There was some concern that the proposed convenience store might draw business from the communities. It was pointed out that its distance from the communities and the nature of the goods for sale, would inhibit use by community residents. As a matter of fact, the park will stimulate local business since visitors will undoubtedly shop and drive outside the park.

The impact on social life of the communities was discussed and the consenses was that there would not be any negative social consequences given the numbers and types of visitors attracted to the park. On the contrary, these new facilities would not only provide direct employment but would also give the communities a great opportunity to provide vacation activities such as, boat tours, fishing trips, hay rides, pony rides, etc.

In summary, it was clear from these meetings that the local residents did not foresee any undesirable or negative impacts from this development. Rather, it was felt that the local area was in need of development and the type proposed was seen as attractive to both visitors and local residents.

5. PUBLIC PERCEPTION OF THE PROPOSED ACTION (cont'd)

St. John's

This meeting, which was held at the Lester Hotel, was attended by about 75 people. A more wide ranging array of concerns was expressed at this meeting than was expressed at the St. Mary's Bay communities. The people present represented a wider range of interest groups, such as the Salmon Association of Eastern Newfoundland, residents of nearby Deer Park, news media and residents of St. John's.

The following concerns were raised and have been dealt with in this EIS:

- Will the project be ready for opening by next May 24th weekend?
- Will sewage from the area enter Salmonier River and consequently affect the water temperature as well as polluting the water downstream?
- What steps will be taken to guard against forest fires?
- What effect will increased salmon fishing have on Salmonier River?
- Will there be overcrowding along the Salmonier River?

5. PUBLIC PERCEPTION OF THE PROPOSED ACTION (cont'd)

The following additional concerns were raised and were addressed as follows:

- How will people be controlled from wandering all over the property and ruining the forests and landscaping?

  Most of the area is heavily forested or boggy and without improvements, access will be restrictive. Patrons of the park will be directed between areas by well defined roads or trails that traverse these forests and bogs.

- Will the clearing of trees for walking trails, picnic sites, etc., result in windthrowing of other trees?

  A minimum of clearing will reduce the problem of windthrowing .

- Will there be protection for children if walking trails are constructed near the banks on Hender's Brook?

  Guard rails or fences will be constructed where walking trails abut steep banks of Hender's Brook.

- Will Salmon fishermen be allowed access to the Salmonier River where it borders this development?

5. PUBLIC PERCEPTION OF THE PROPOSED ACTION (cont'd)

There is a public right of way on either side of the Salmonier River.

- What effect will the closeness of campgrounds have on Hender's Brook, e.g. children playing in the brook?

The provision of swimming facilities, playgrounds and other attractions should preclude such activity. In any event, this activity will not be permitted and will be prevented by constant surveillance by park personnel.

- Will boating, canoeing or swimming be permitted in Hender's Brook or Salmonier River?

These activities will be banned in Hender's Brook, however, Salmonier river is outside this development and such activity can only be discouraged. As a matter fact, neither Hender's Brook nor the Salmonier River particularly lends itself to this sort of activity.

In addition to these public meetings, the project manager presented a paper to the Southern Avalon Tourism Committee on April 20, 1985. Approximately 75 people attended this meeting. The general expression was one of support for the project.

## 6. MITIGATION AND RESIDUAL HARMFUL IMPACTS

Information already provided in this EIS, indicates the various steps that will be taken to minimize environmental impacts. Every effort will be made to ensure that there are no residual harmful impacts caused by construction. Continuous monitoring and surveillance by park personnel and government agencies will guard against any future harmful impacts.

## 7. MONITORING

Because of the diversity of activities and also because of the necessity of constructing facilities within a short time period, it will be necessary to break the work down into several contracts as follows:

- Road construction
- Water and sewer installations
- Lodge construction
- Chalet construction
- Convenience store and other small buildings construction
- Clearing of camp ground, picnic sites and hiking trails
- Landscaping.

Detailed plans and specifications will be prepared by Architectural and Engineering firms for these contracts. Such plans and specifications will reflect the environmentally sensitive nature of work in this area and special construction techniques will be identified.

The overall responsibility for reducing environmental impacts to a minimum during construction will rest with the Project Managers, McNeill Management Limited. Full time inspectors will be employed on the job to ensure that these requirements are carried out.

7. MONITORING (cont'd)

After all facilities have been completed, various personnel will be assigned specific duties, under the direction of the park manager, to ensure that environmental damage will not be caused during operation of the park. Such duties will include:

Continuous Surveillance and Cleanup

Park personnel will continuously travel throughout the park area to ensure that all park regulations are followed such as:

- proper use of camp fires
- proper disposal of garbage
- no swimming except in designated areas
- no boating or canoeing
- noise levels are contained.

Monitoring of Water Quality and Sewage Disposal

A trained park attendant will be required to carry out a daily check to ensure that all water supply and sewage disposal equipment is functioning properly. In addition, periodic checks will be made to ensure that quality of potable water, water for swimming pools and slides, and sewage disposal are within acceptable limits.

7. MONITORING (cont'd)

Monitoring of Access to the Avalon Wilderness Area

It has been previously suggested in this report that access to this area may be controlled by issuing permits at the lodge.

Contingency Plan for Dealing with Emergencies such as a Forest Fire or an Oil Spill

Park personnel will be properly trained to deal with such emergencies. Telephone numbers of key people to contact such as Emergency Measure Organization, Canadian Forestry Service, etc. will be posted in conspicuous places. The general public will be advised of the emergency route by pamphlets issued at the entrance to the park. This route will also be located by way of signs.

## 8. ABANDONMENT

Should abandonment of the development occur, it will undoubtably be due to economic reasons. This may occur either during construction or after the park has become operational.

(1) During Construction

Depending upon the stage at which abandonment occurs, two scenarios may occur:

(a) the proponent will persue the sale of the development to potential buyers.

(b) the development will be permanently abandoned with materials salvaged and sold.

In the case of the latter, the site will be returned to a safe and stable condition as much as possible. Hender's Brook will be allowed to flow its normal course, swimming pools will be backfilled, water flumes will be removed and in general, the site will be allowed to return to its former condition.

8. ABANDONMENT (cont'd)

(2) After Construction

Once the development has been completed and made operational, should it prove to be not viable and abandonment is desired, these options are available to the proponent.

(a) Persue the sale of the development to potential buyers for the continuation of facility as a park.
(b) Retain control of the facility, seek other uses for the main building while salvaging other infrastructure no longer of use.
(c) Completely abandon the facility and salvage as much of the infrastructure as possible.

Other uses that the building may be put to have been considered such as a private school, specialized training facility, private recreational facility, etc. Naturally, all these avenues would be explored in the event of a financial collapse of the development.

As before, in the case of complete abandonment, the site will be stabilized and made safe with most of the infrastructure being salvaged and sold.

## 9. REFERENCES

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Preliminary Investigation
Groundwater Potential and Suitability
for on Site Sewage Disposal
Nolan Davis & Associates Ltd.
December, 1984

Soils Reports
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May, 1985

Moose Populations 1980-84
Wildlife Division

## 10. BIBLIOGRAPHY

No bibliographical information was used in the preparation of this E.I.S.

## 11. PERSONNEL

The following personnel have been directly involved in the preparation of this E.I.S.

Gerald Moores, P. Eng., B.E. Civil (NSTC 1961)
Project Manager

Has worked in all facets of engineering in Newfoundland over the past 23 years. Has had considerable experience in Government work, contracting and consulting. Has been employed as Project Manager with McNeill Management Ltd. for the past 2 years.

William MacCallum, B. Arch. (NSTC 1968), N.A.A., M.R.A.I.C.,
Architect

Worked in Canada, England and the United States, both as a student and graduate architect. Has had extensive experience in all aspects of building types in Newfoundland since 1973. Has been in private practice for past 4 years.

K. Richard Gosse, B. Eng. (1974 MUN), P. Eng.
Civil Engineer

Has worked in many areas of municipal servicing, treatment facilities, site works and site development on numerous projects throughout Newfoundland and Labrador.

# APPENDIX A

In the species composition of the community descriptions, 2 numbers or symbols follow each species. These symbols refer to the abundance and sociability scale shown below. This is a modified form of the Braun-Blanquet method described in Mueller-Dombois, D., and H. Ellenberg, 1974. This scale was used to provide a more complete picture of the importance of each species in the communities.

Abundance - Cover Scale

| | | | |
|---|---|---|---|
| + | - sporadic, few scattered plants, <1% cover | | |
| 1 | - cover <5% | $1^-$ | cover 1-2% |
| | | $1^+$ | cover 2-5% |
| | | $1^p$ | common, but maybe <1% cover |
| 2 | - cover 5-25% | $2^-$ | cover 5-12 1/2% |
| | | $2^+$ | cover 12 1/2-25% |
| | | $2^m$ | abundant, but <5% cover |
| 3 | - cover 25-50% | | |
| 4 | - cover 50-75% | | |
| 5 | - cover 75-100% | | |

APPENDIX A (cont'd)

Sociability

1 - growing singly

2 - in small tufts or tussocks

3 - in large patches

4 - in carpets, covering at least 50% of the area

5 - in almost continuous carpets

For example, Kalmia angustifolia, on page 55, is followed by the symbols 3.1, which means this species covers 25-50% of the area, and grows singly.